FCC CFR47 PART 15 SUBPART C
CERTIFICATION TEST REPORT

FOR

Smart Cellular Telephone with CDMA 1xRTT/CDMA 1xEVDO Rev. A, Bluetooth and WiFi 802.11 b,g,n

MODEL NUMBER: A1349

FCC ID: BCG-E2422B

REPORT NUMBER: 10U13473-2, REVISION A

ISSUE DATE: JANUARY 10, 2011

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	11/23/10	Initial Issue	T. Chan
A	1/10/11	Updated “Description of EUT” and removed MPE Sections	C. Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	APPLE, INC 1 INFINITE LOOP CUPERTINO, CA 95014, U.S.A.
EUT DESCRIPTION:	Smart Cellular Telephone with CDMA 1xRTT/CDMA 1xEVDO Rev. A, Bluetooth and WiFi 802.11 b,g,n
MODEL:	A1349
SERIAL NUMBER:	C8QDH002DHP3
DATE TESTED:	NOVEMBER 10~17, 2010

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass

Compliance Certification Services (UL CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

THU CHAN
ENGINEERING MANAGER
UL CCS

Tested By:

TOM CHEN
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The Apple iPhone, Model A1349 is a smart phone with iPod functions (music, application support, and video), CDMA 1xRTT/CDMA 1xEVDO Release A, 802.11b/g/n, and Bluetooth 2.1+EDR. This device measures 115.2 mm (4.5 inches) tall x 58.6 mm (2.31 inches) and 9.3 mm (0.37 inches) thick and weighs 137 grams (4.8 oz.) The rechargeable battery is not user accessible.

The WLAN module is manufactured by Semco.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	Basic GFSK	10.93	12.39
2402 - 2480	Enhanced QPSK	12.32	17.06
2402 - 2480	Enhanced 8PSK	10.67	11.67

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna, with a maximum gain of -1.2 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 0.6.13_21

The EUT software installed in the equipment during testing was 8E5074b.

The test utility software used during testing was Broadcom WL tool 4.219 RC46.13

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-position was the EUT with highest emissions. To determine the worst-case, the EUT was investigated for X, Y, and Z-Positions, and the worst position among X, Y, and Z with AC/DC adapter. After the investigations X-position with AC/DC adapter turns out to be the worst-case.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

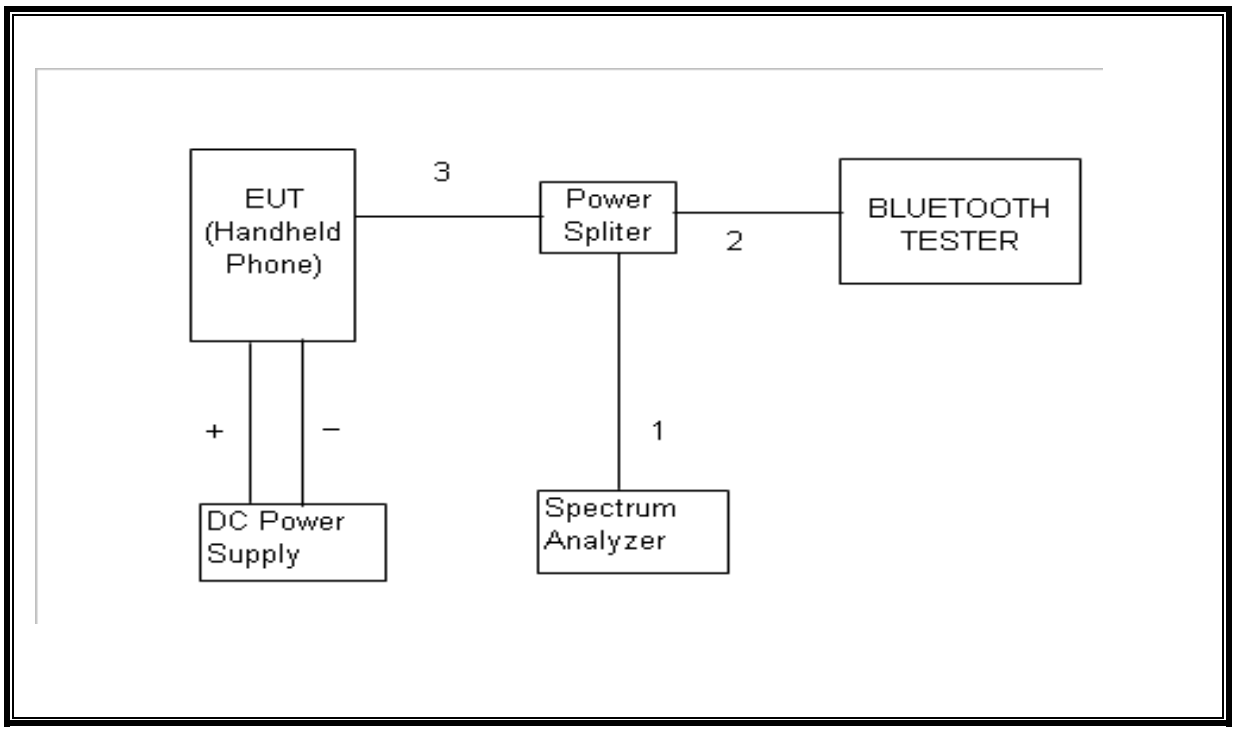
PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
BT Tester	Rohde & Schwarz	CBT	12/17/2174	NA
Splitter	NA	NA	NA	NA
Headset	Apple	NA	NA	NA
Omni-Directional	D-link	ANT24-0400	EMOS159001360	NA

I/O CABLES

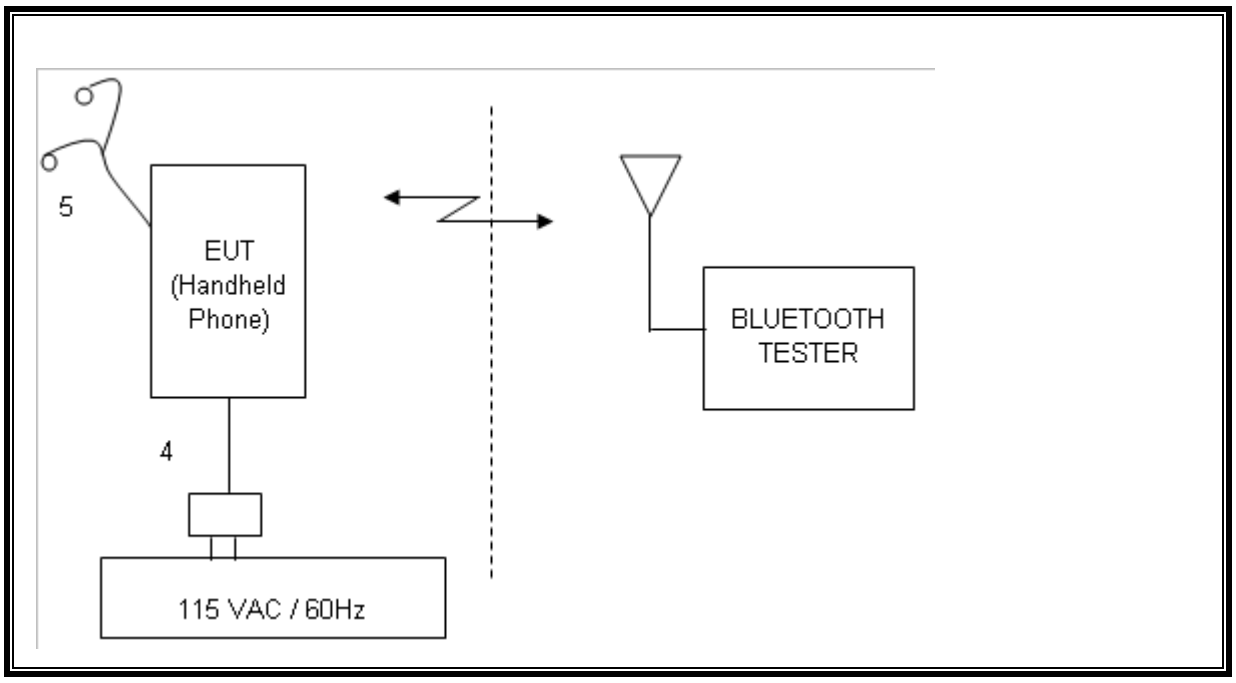
I/O CABLE LIST						
Cable No.	**Port**	**# of Identica Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	In/Out	1	SMA	Shielded	0.2m	NA
2	In/Out	1	SMA	Shielded	0.6m	NA
3	Antenna Port	1	SMA	Shielded	0.1m	NA
4	USB	1	USB	Un-shielded	1m	NA
5	In/Out	1	MINI JACK	Un-shielded	1m	NA

TEST SETUP

SETUP DIAGRAM FOR TESTS (CONDUCTED SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/30/11
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	09/03/11
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/14/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07/14/11
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00778	07/06/11
Antenna, Horn, 18 GHz	EMCO	3115	C00783	06/29/11
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	05/06/11
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/10/11
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	01/07/12
Peak Power Meter	Agilent / HP	E4416A	C00963	12/04/11
Peak Power Meter	Boonton	4541	C01189	02/26/11
Peak Power Sensor	Boonton	57318	C01202	02/23/11
Bluetooth Test	R&S	CBT	NA	05/01/11
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRM50702	N02685	CNR

7. ANTENNA PORT TEST RESULTS

7.1. BASIC DATA RATE GFSK MODULATION

7.1.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

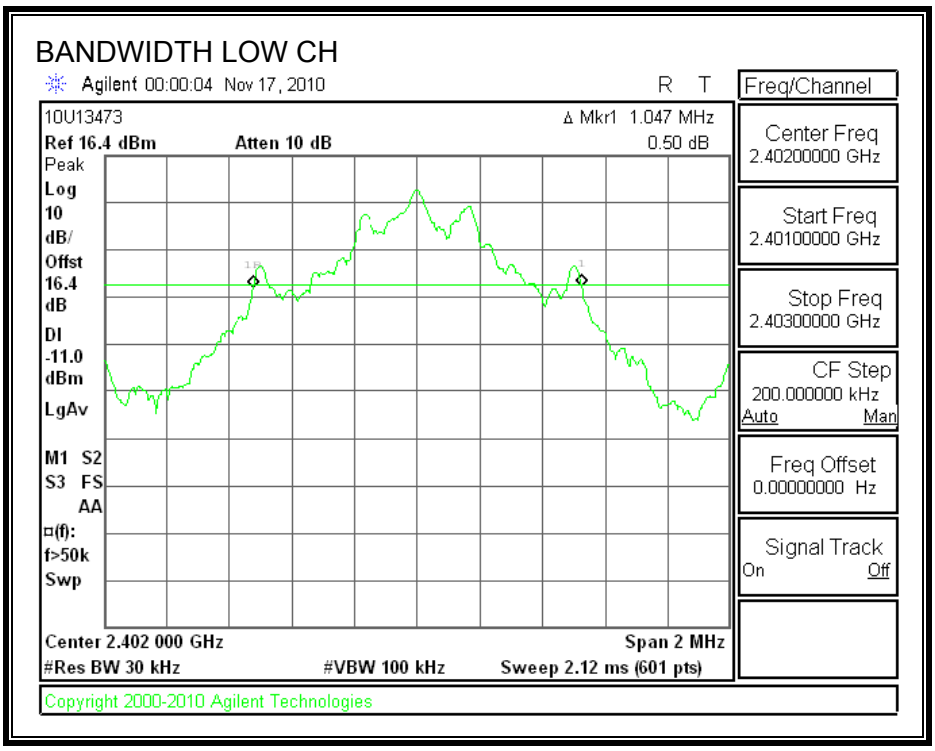
TEST PROCEDURE

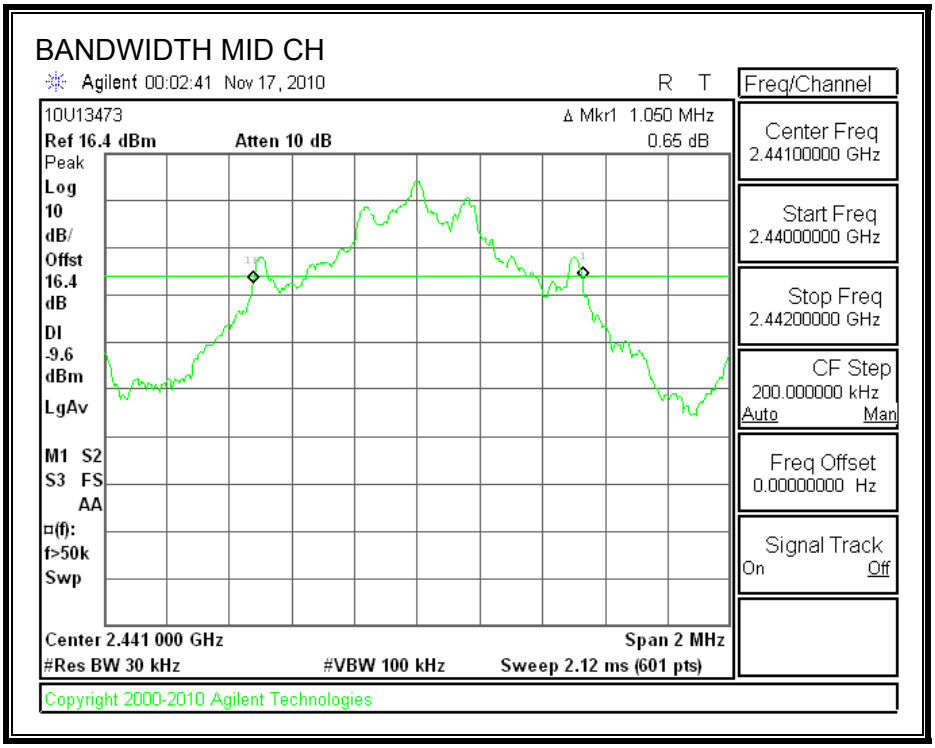
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

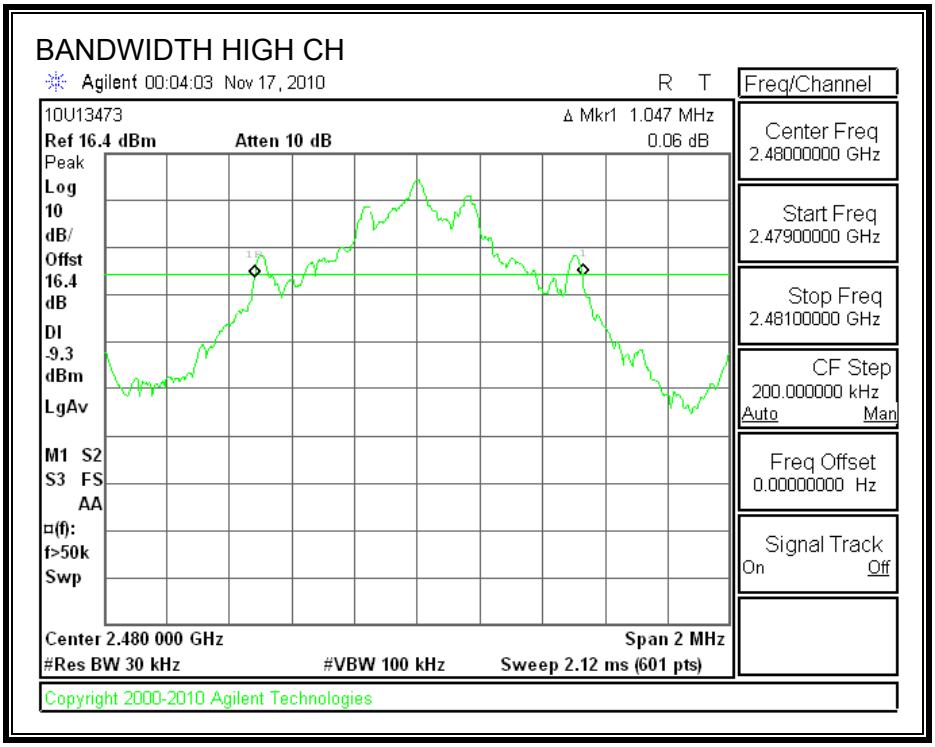
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.047	1.0141
Middle	2441	1.050	1.0191
High	2480	1.047	1.0197

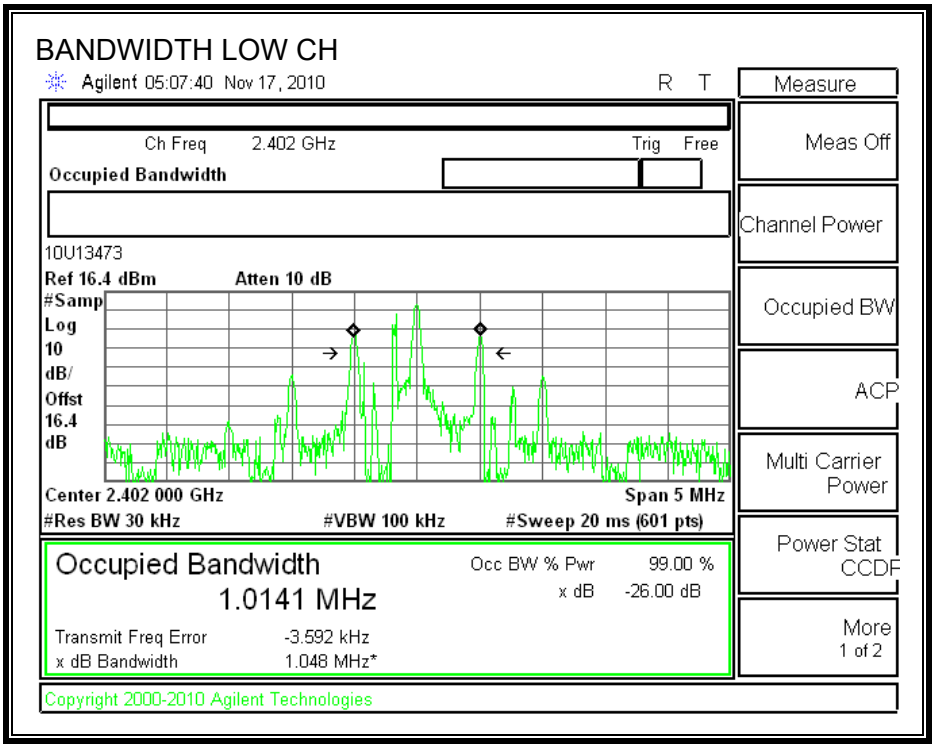
20 dB BANDWIDTH

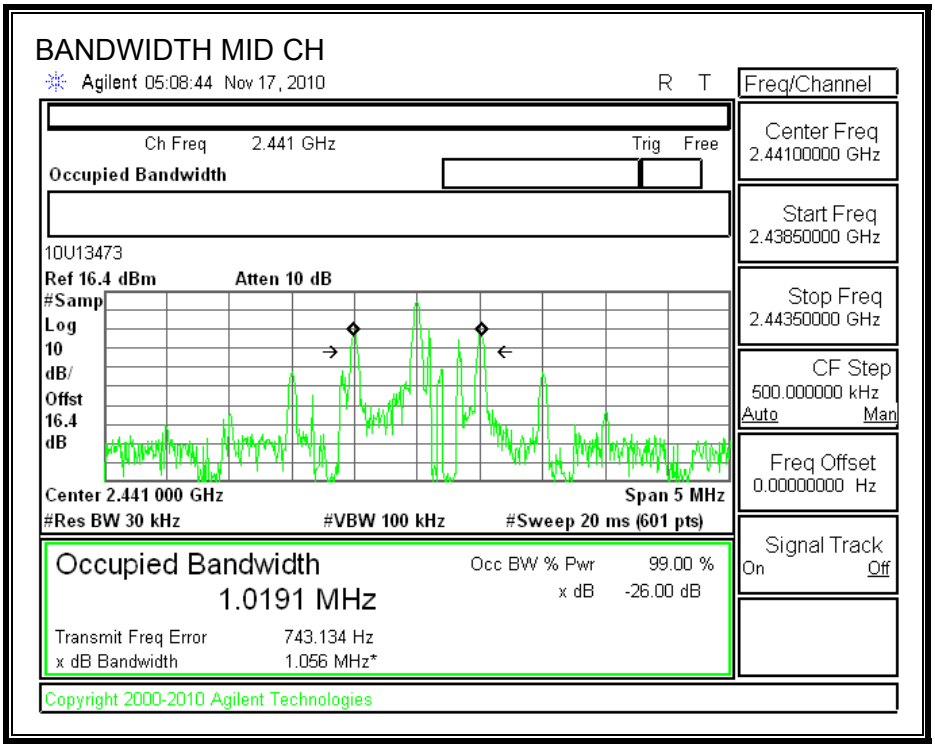


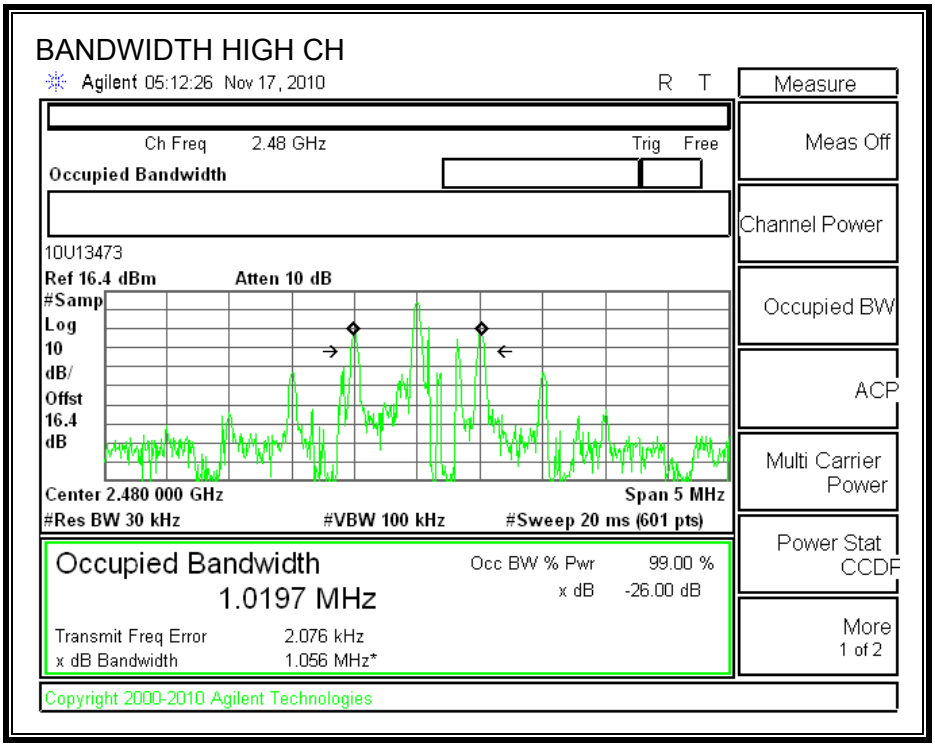




99% BANDWIDTH







7.1.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

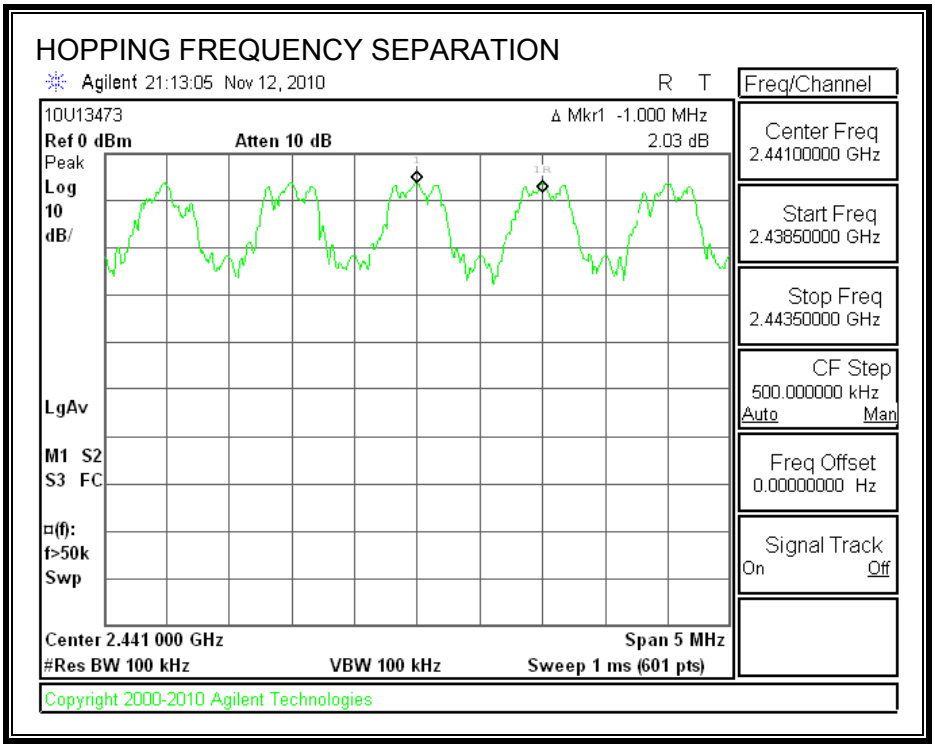
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



7.1.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

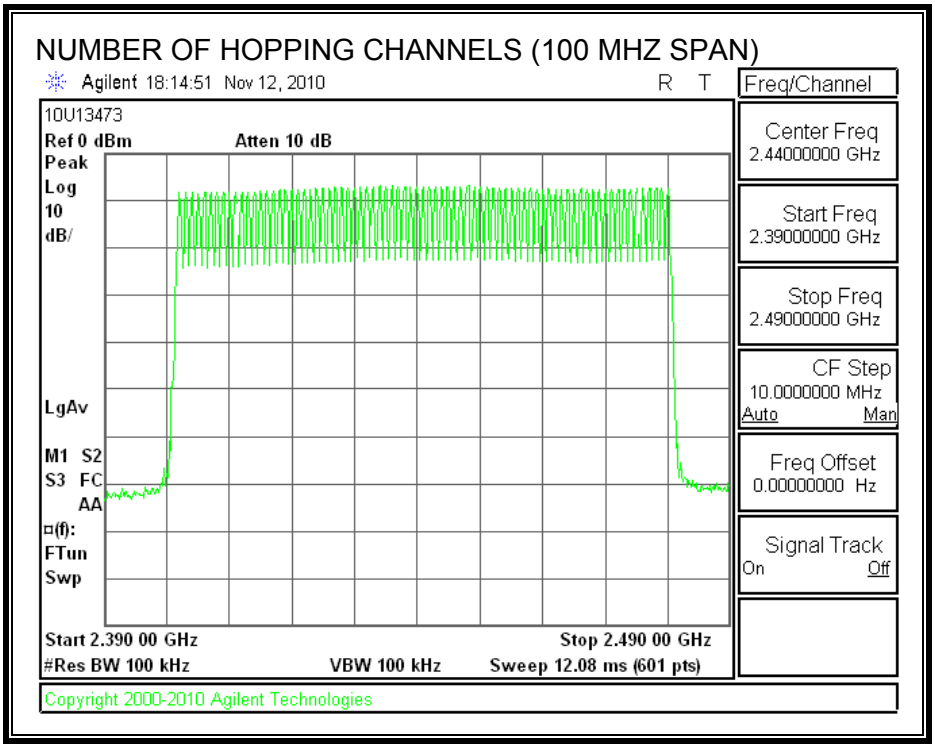
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

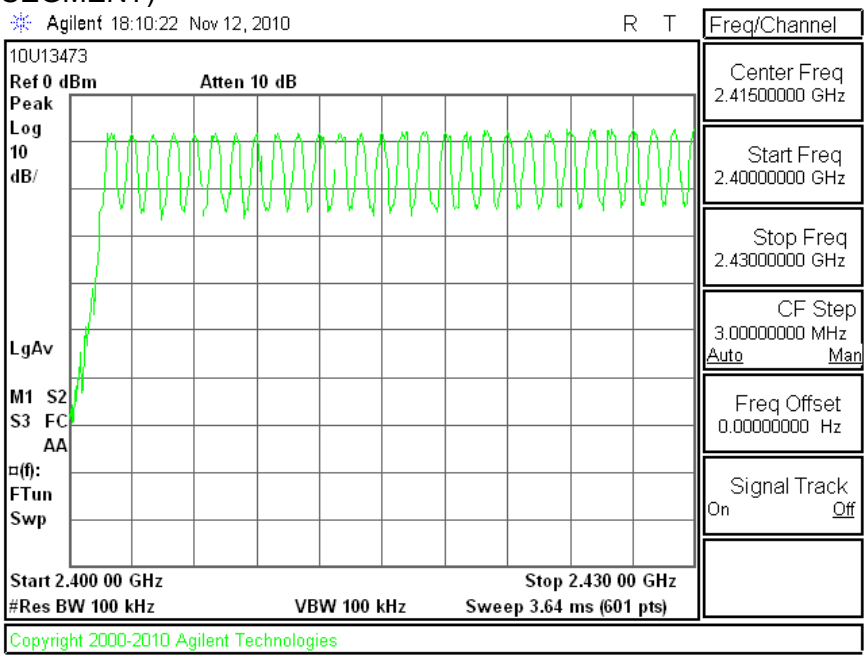
RESULTS

79 Channels observed.

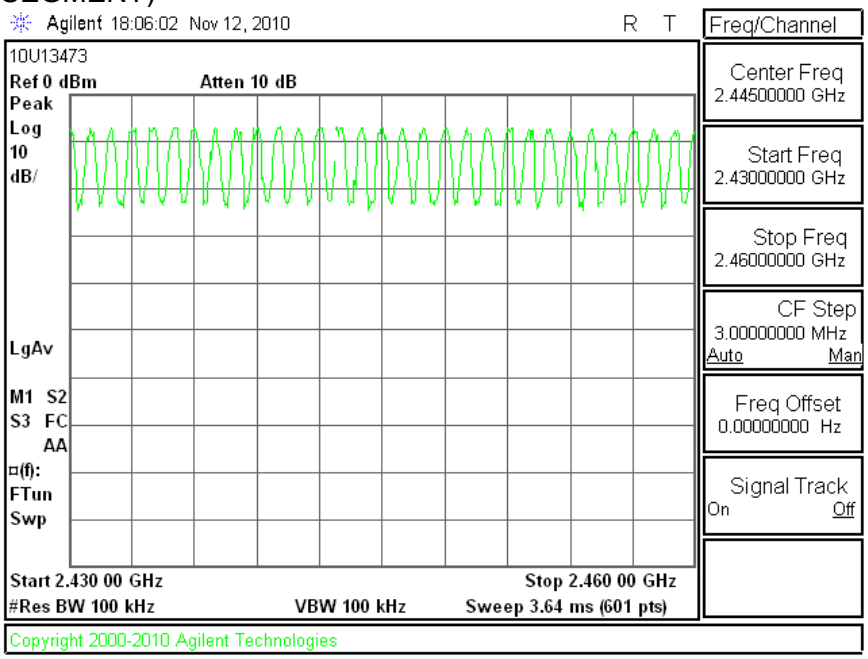
NUMBER OF HOPPING CHANNELS



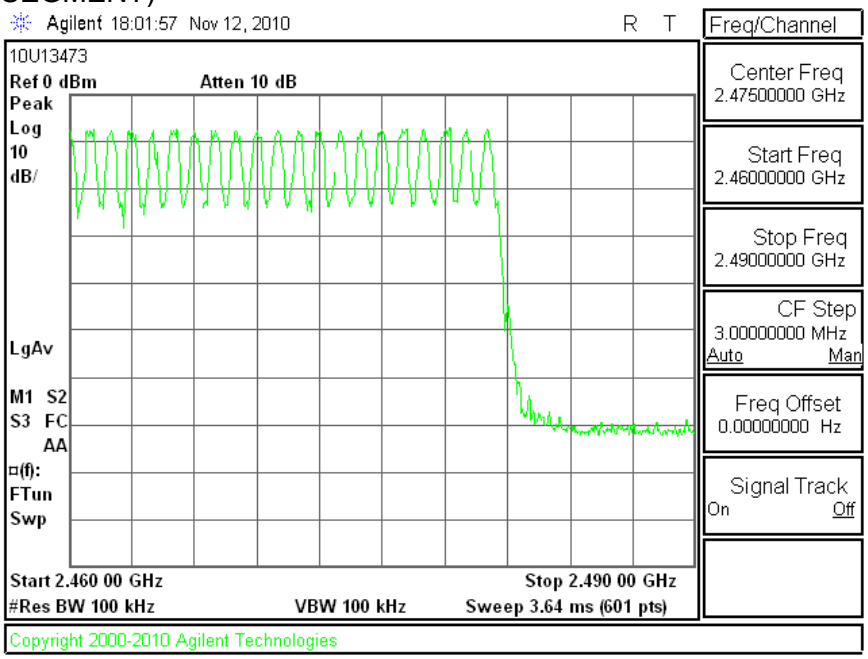
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, THIRD SEGMENT)



7.1.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

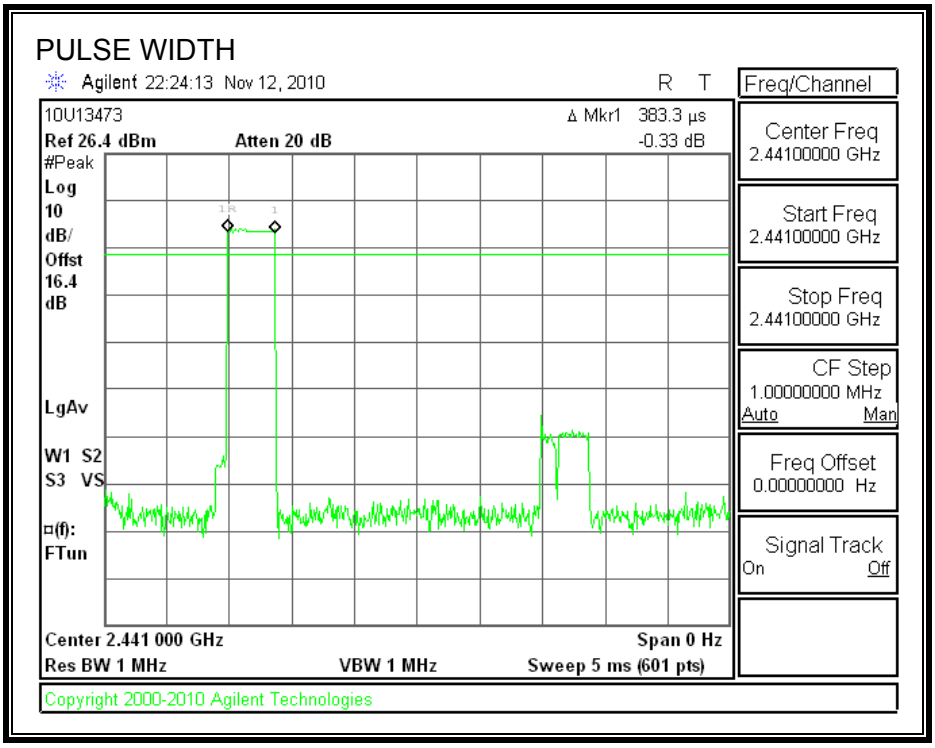
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

RESULTS

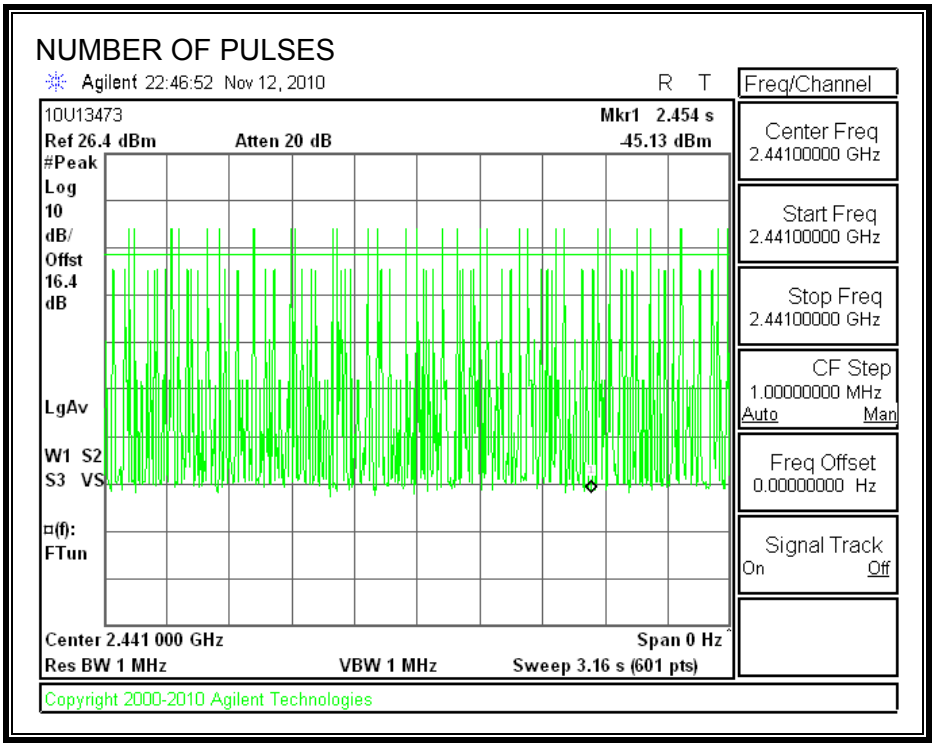
GFSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.383	30	0.115	0.4	0.285
DH3	1.642	16	0.263	0.4	0.137
DH5	2.883	11	0.317	0.4	0.083

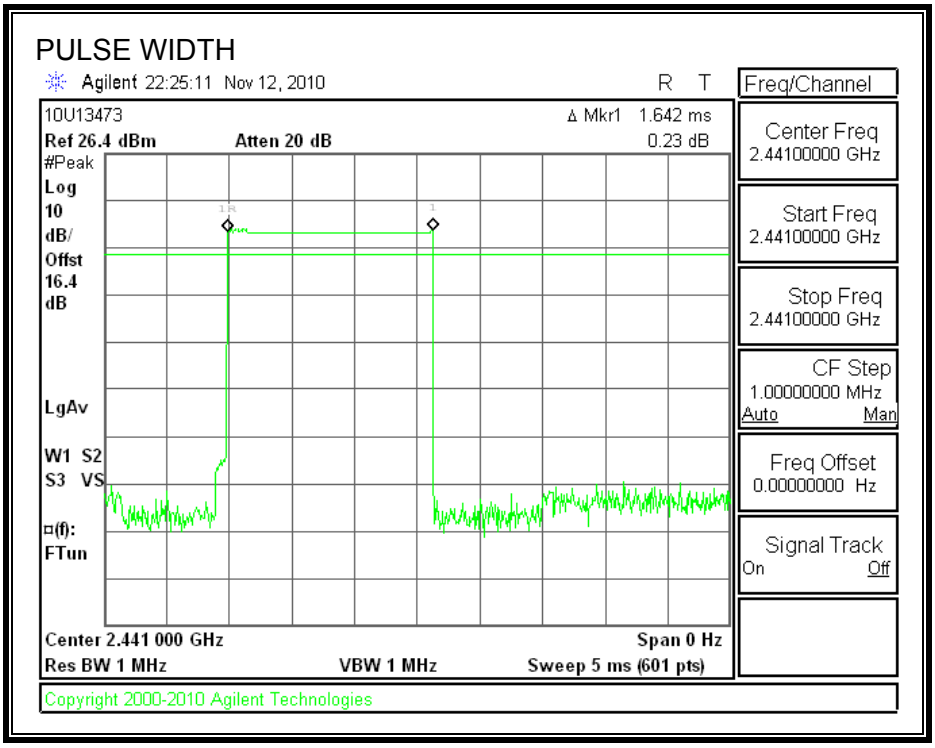
PULSE WIDTH GFSK DH1



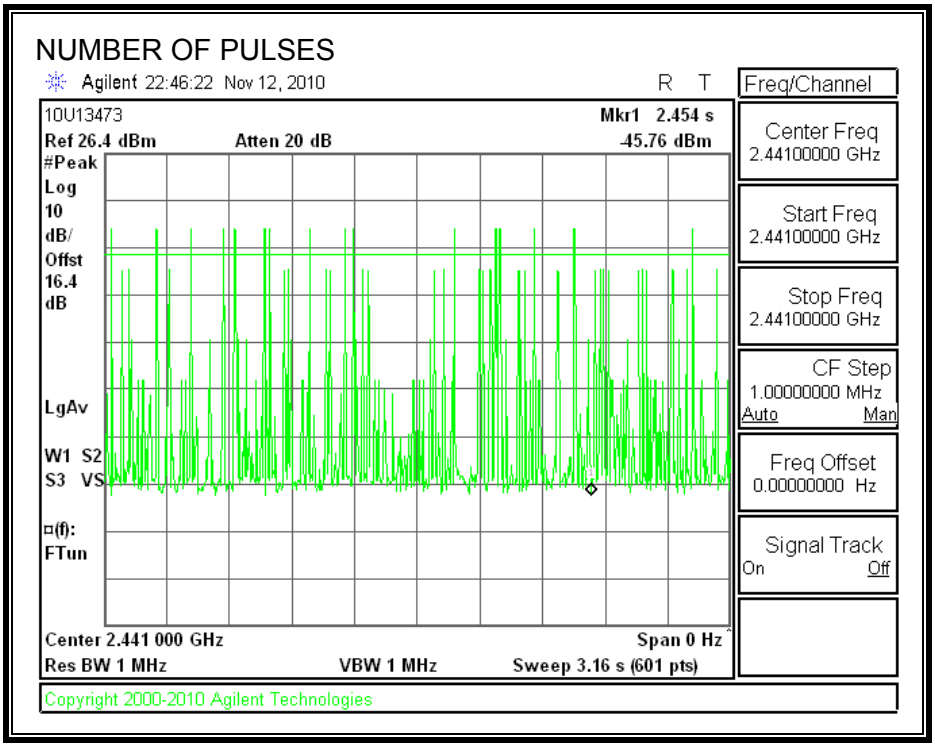
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



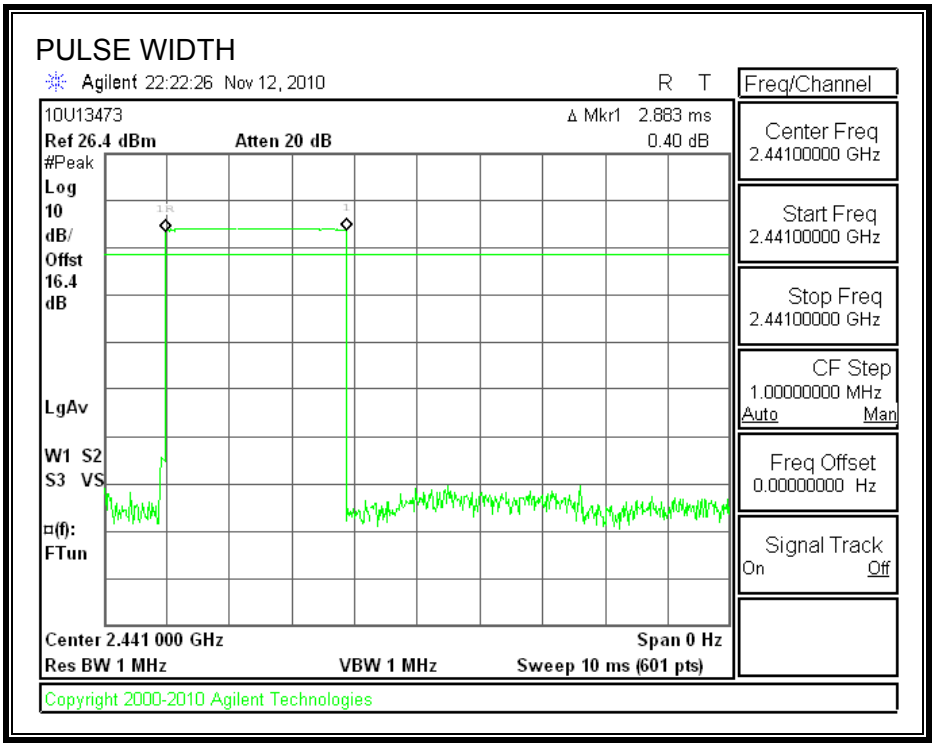
PULSE WIDTH GFSK DH3



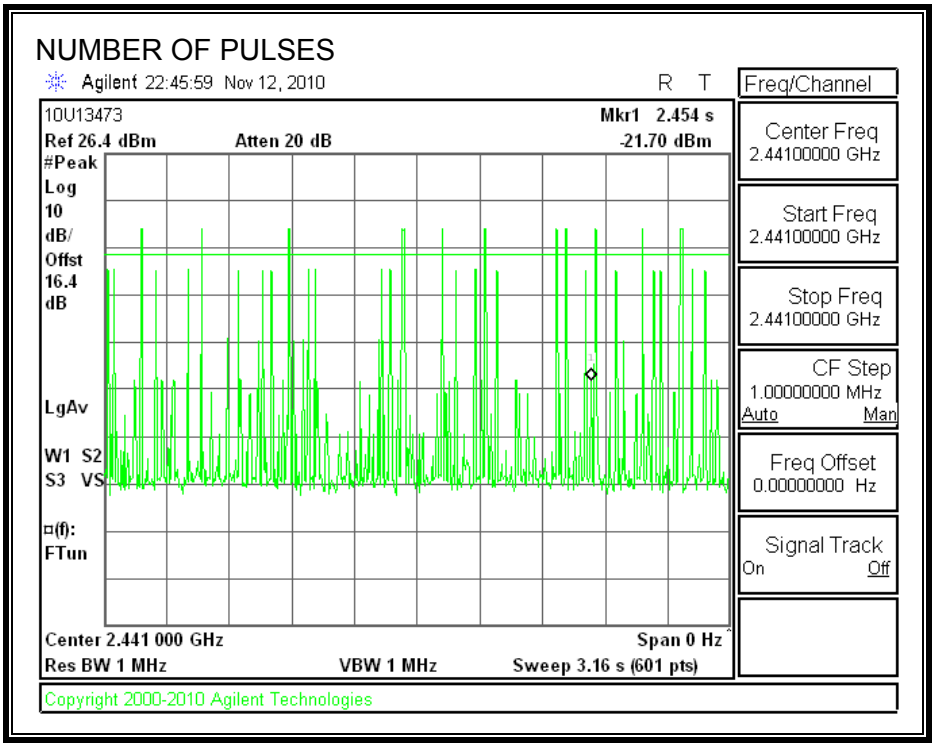
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



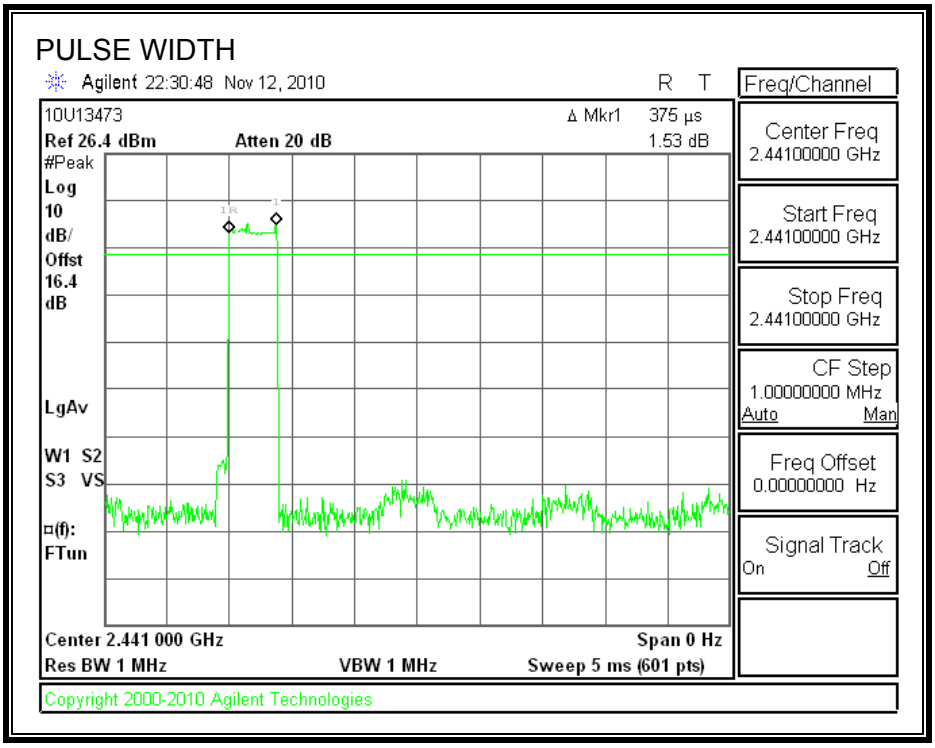
PULSE WIDTH GFSK DH5



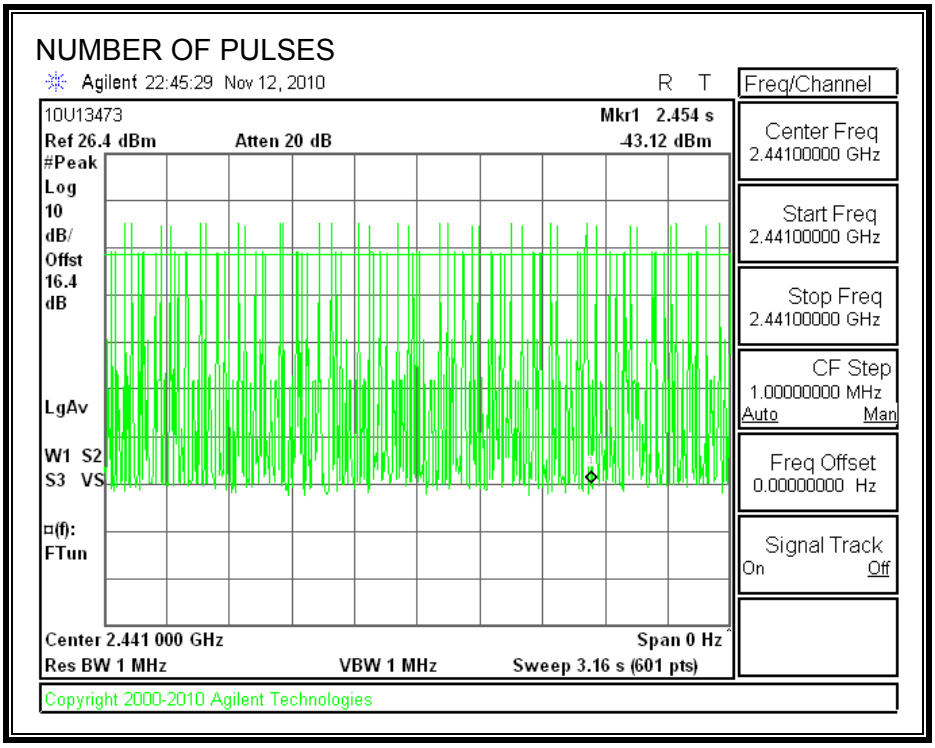
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



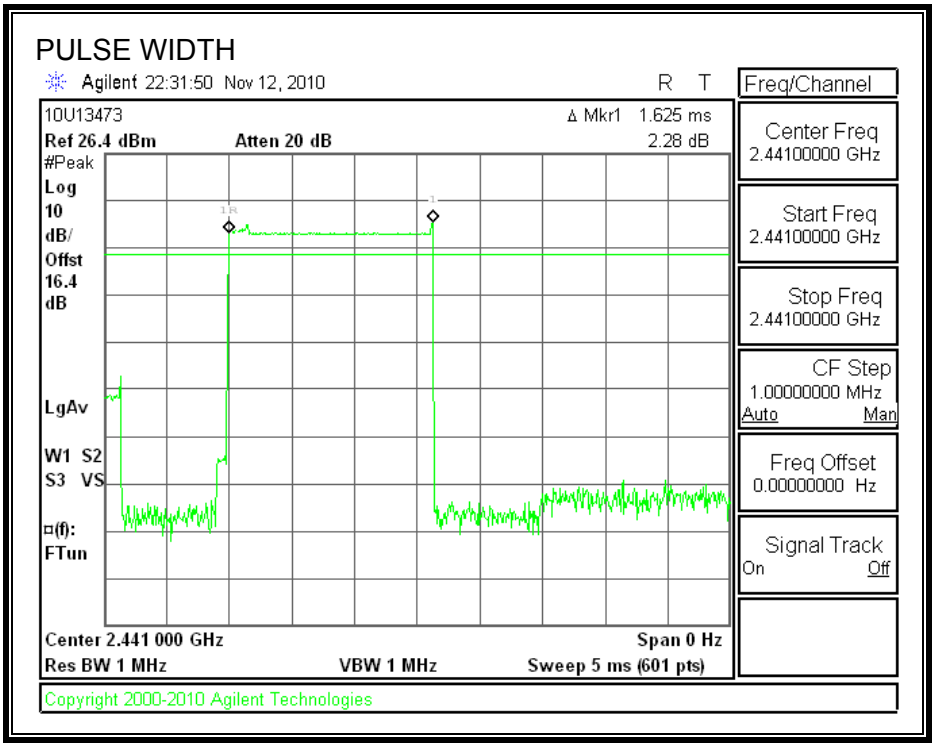
PULSE WIDTH DQPSK DH1



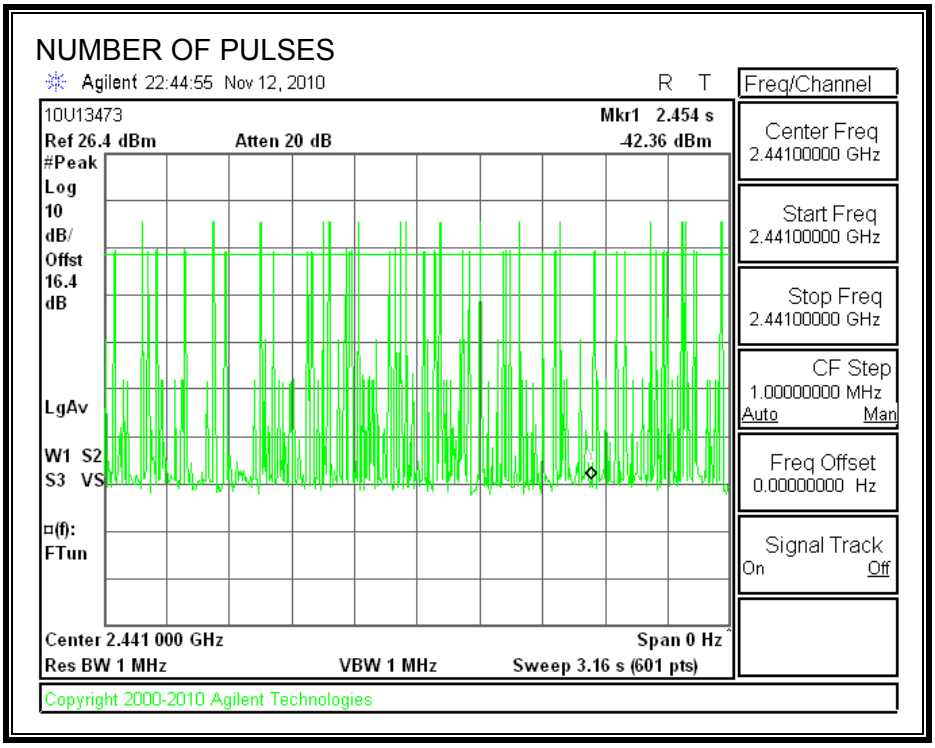
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



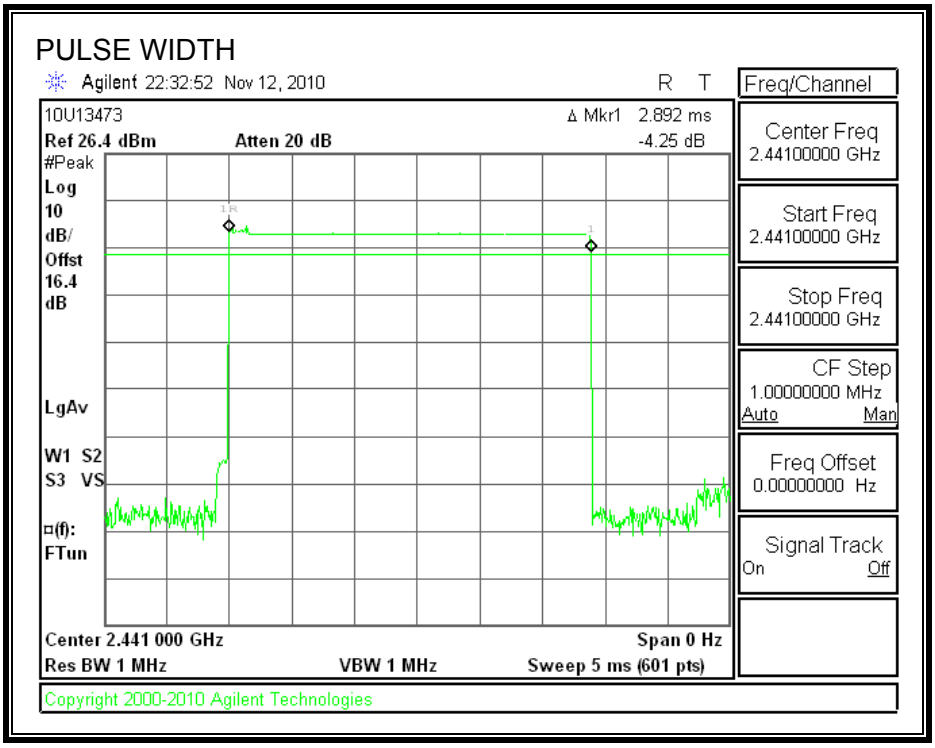
PULSE WIDTH DQPSK DH3



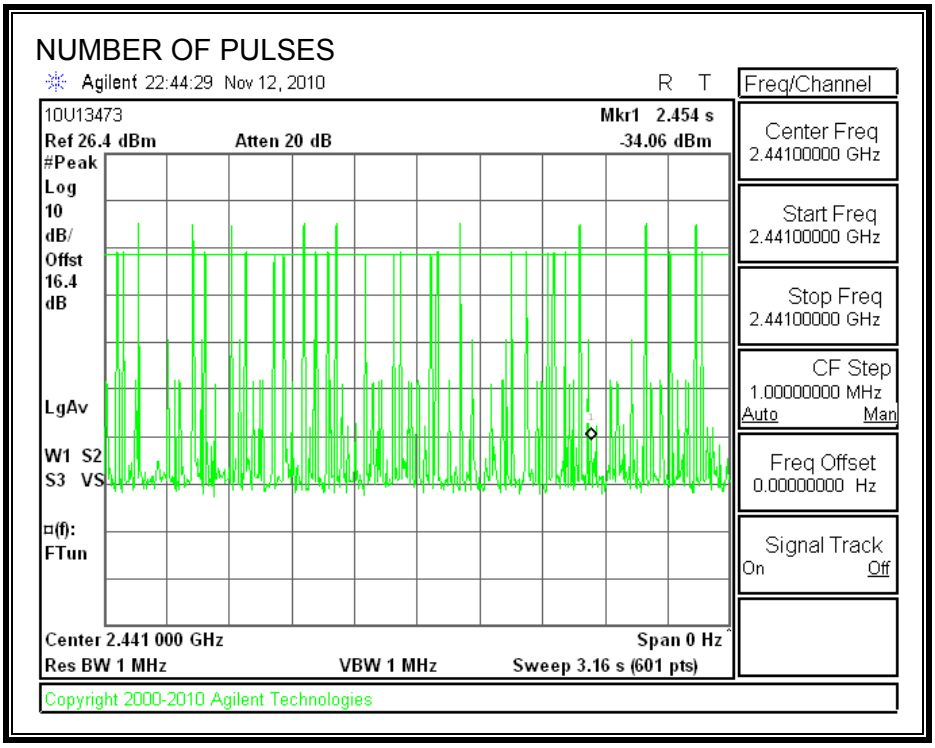
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



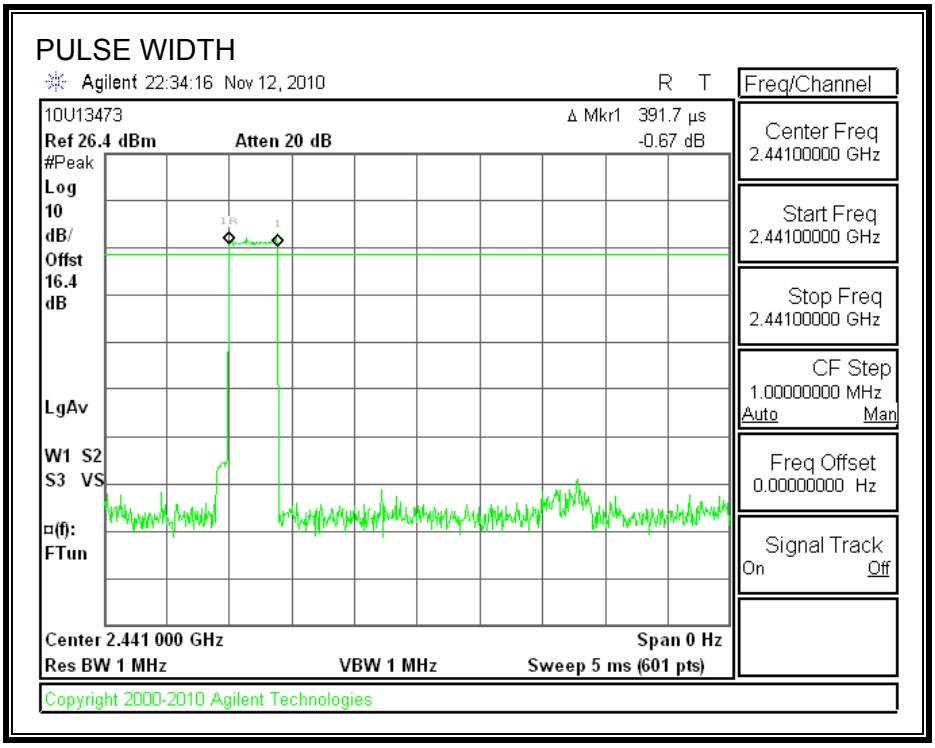
PULSE WIDTH DQPSK DH5



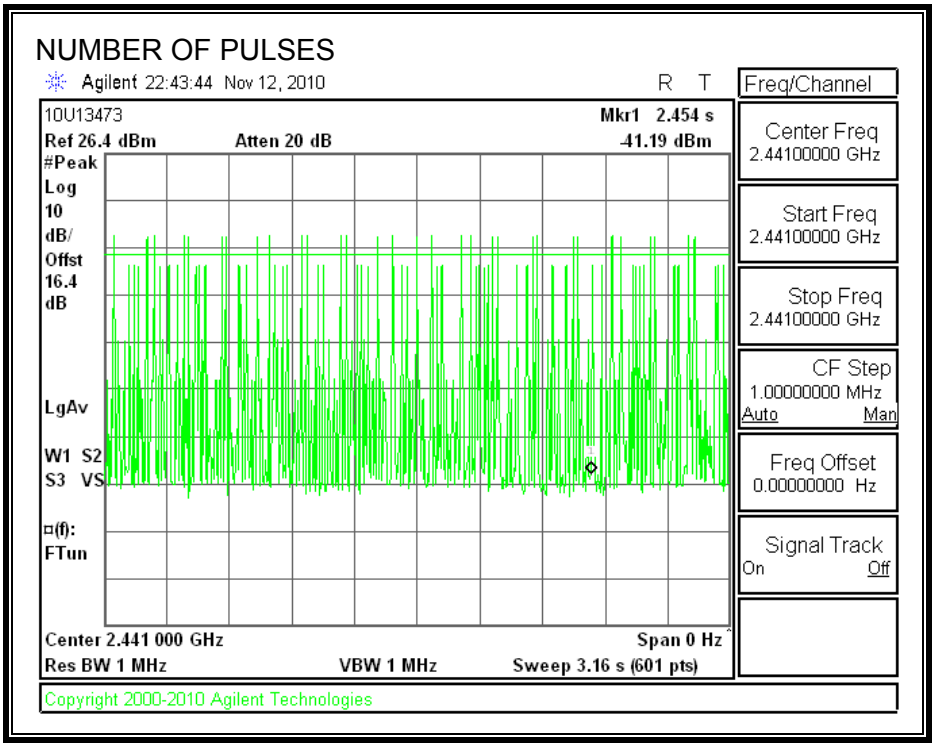
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



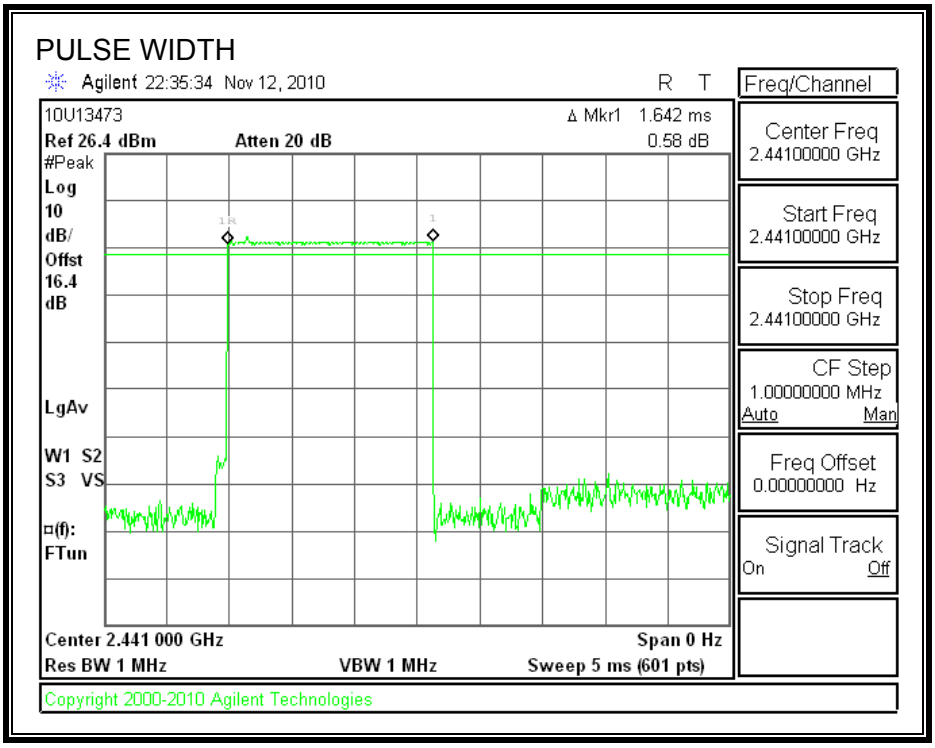
PULSE WIDTH 8PSK DH1



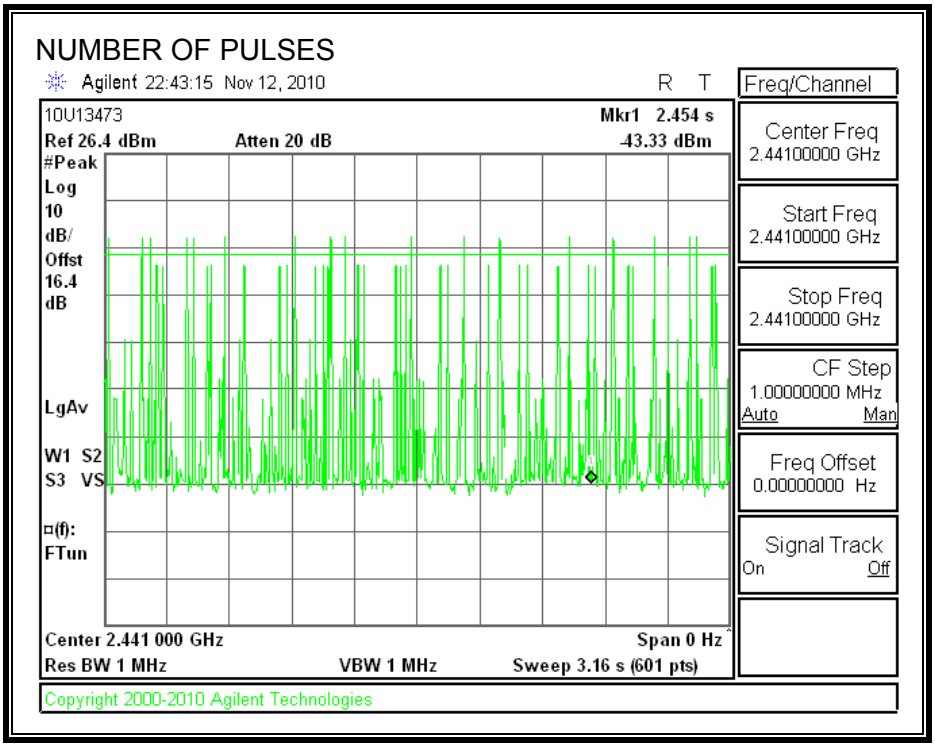
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



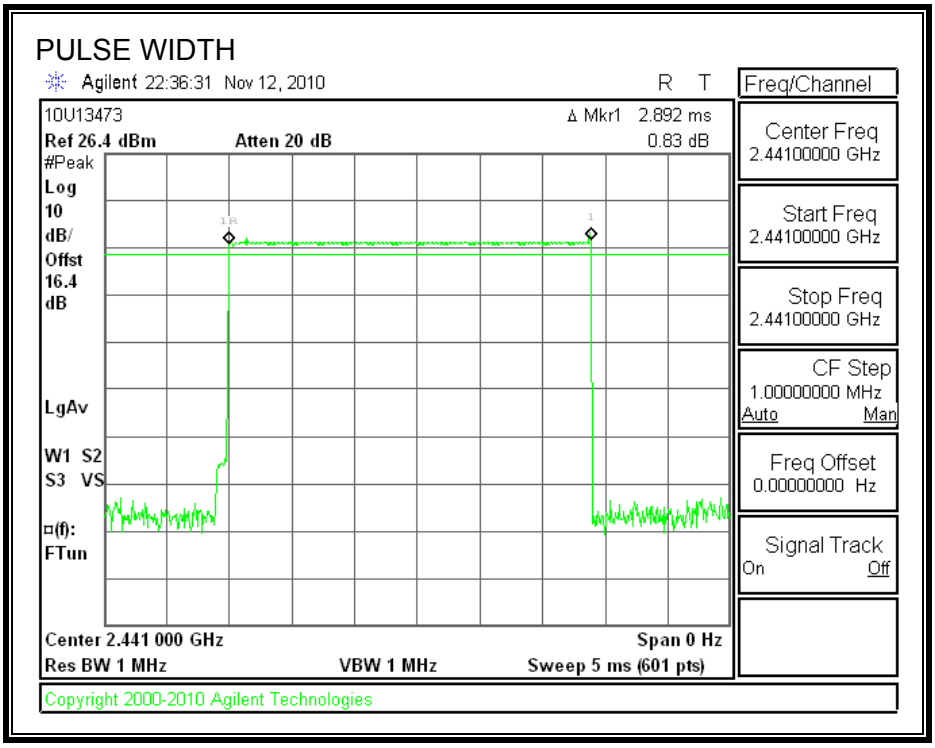
PULSE WIDTH 8PSK DH3



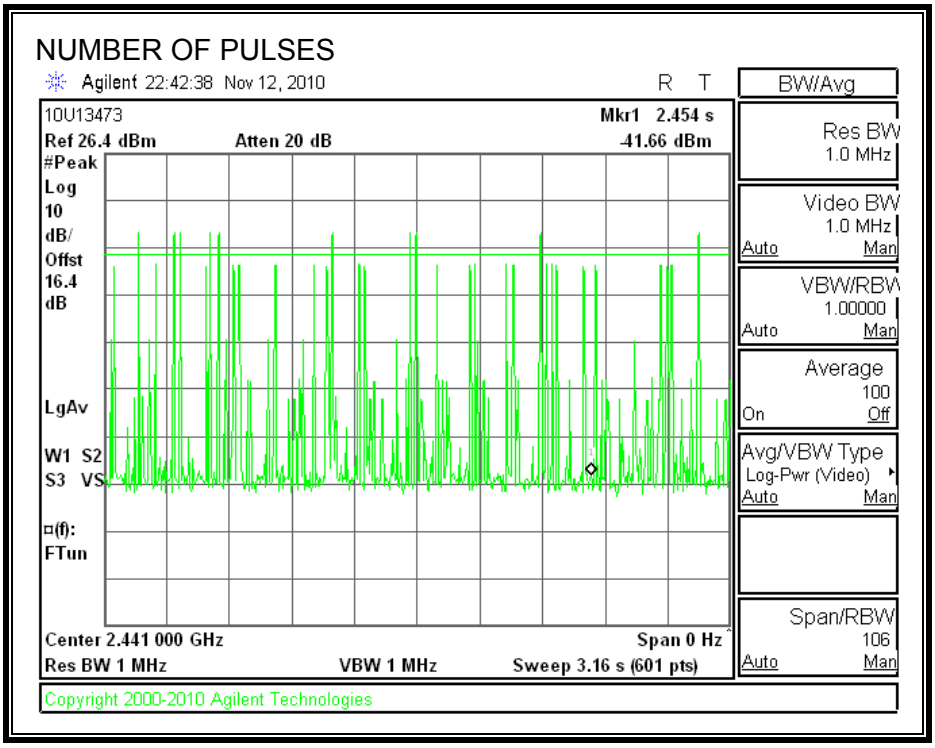
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



PULSE WIDTH 8PSK DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.1.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

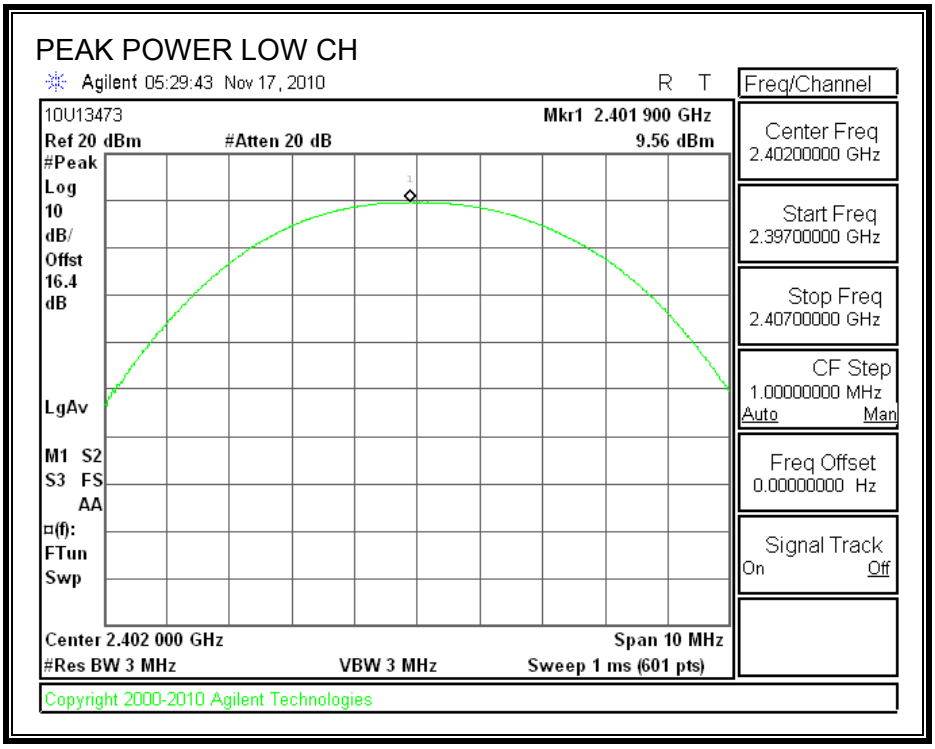
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

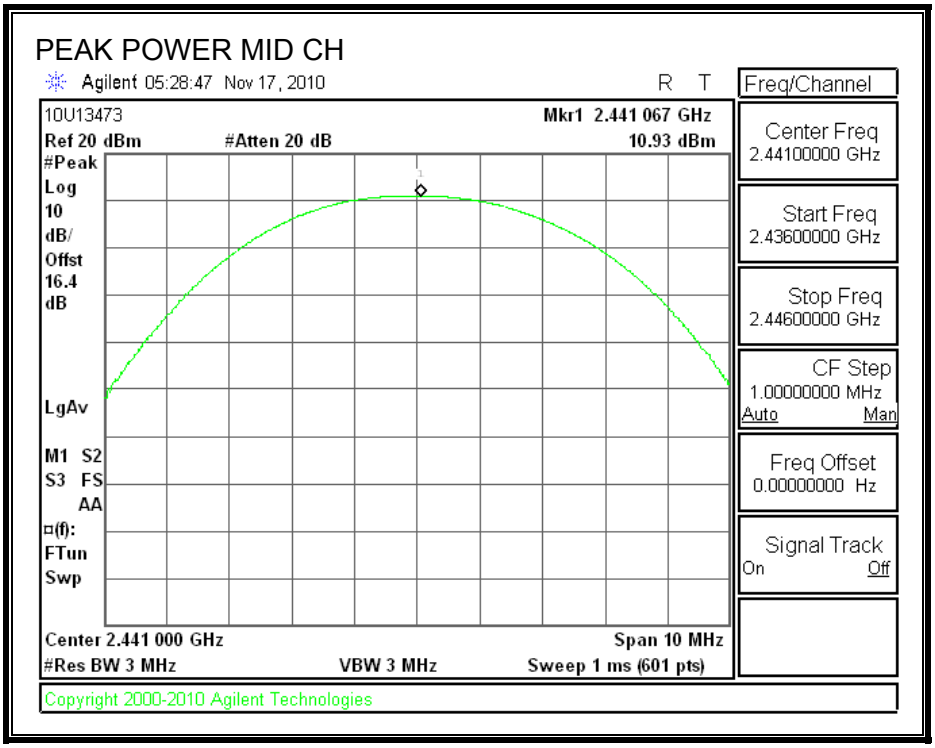
RESULTS

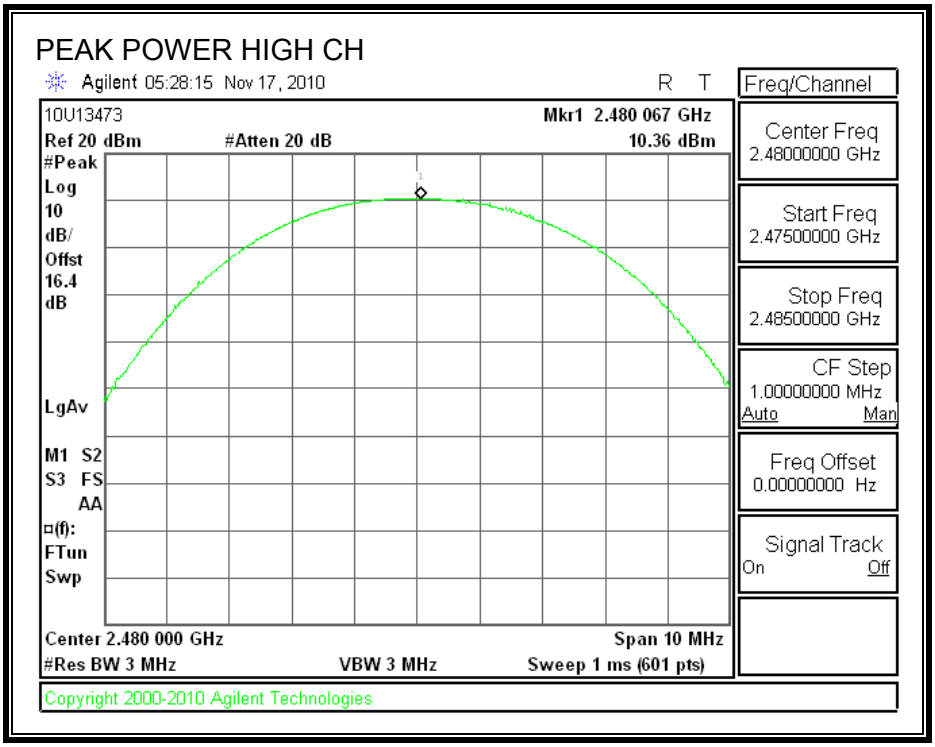
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.56	30	-20.44
Middle	2441	10.93	30	-19.07
High	2480	10.36	30	-19.64

OUTPUT POWER



PEAK POWER MID CH





7.1.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.4 dB (including 10 dB pad and 0.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	9.10
Middle	2441	9.90
High	2480	10.10

7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

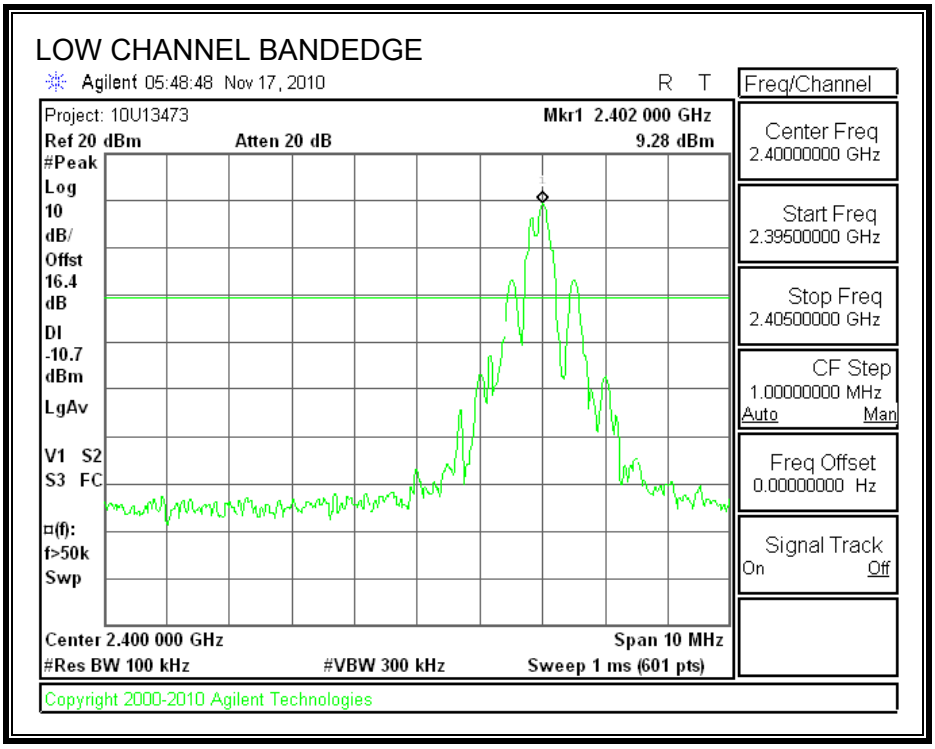
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

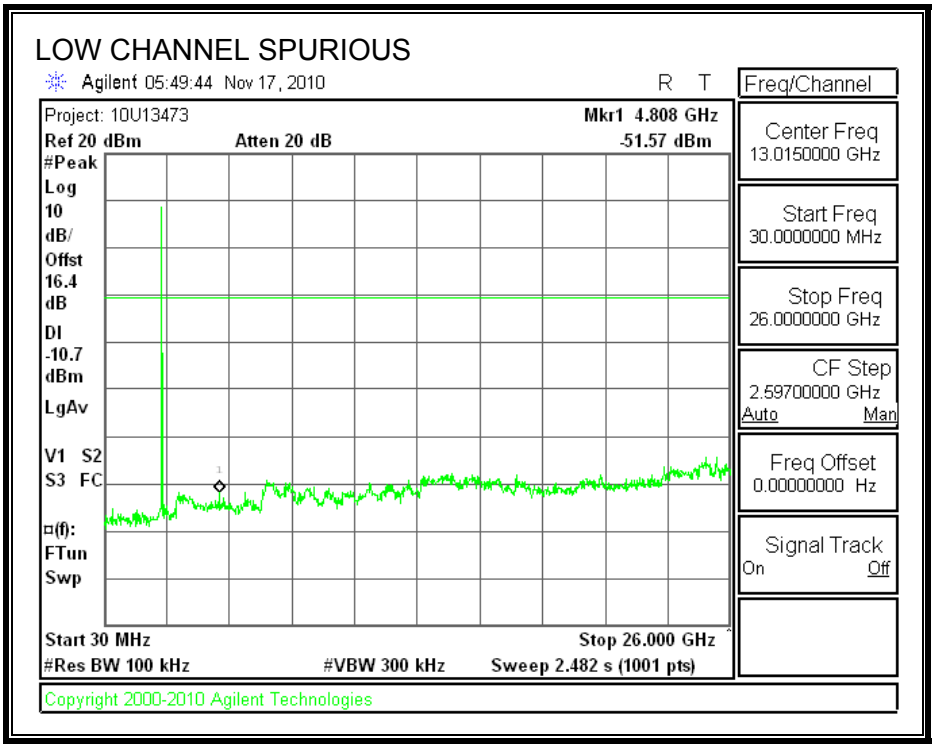
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

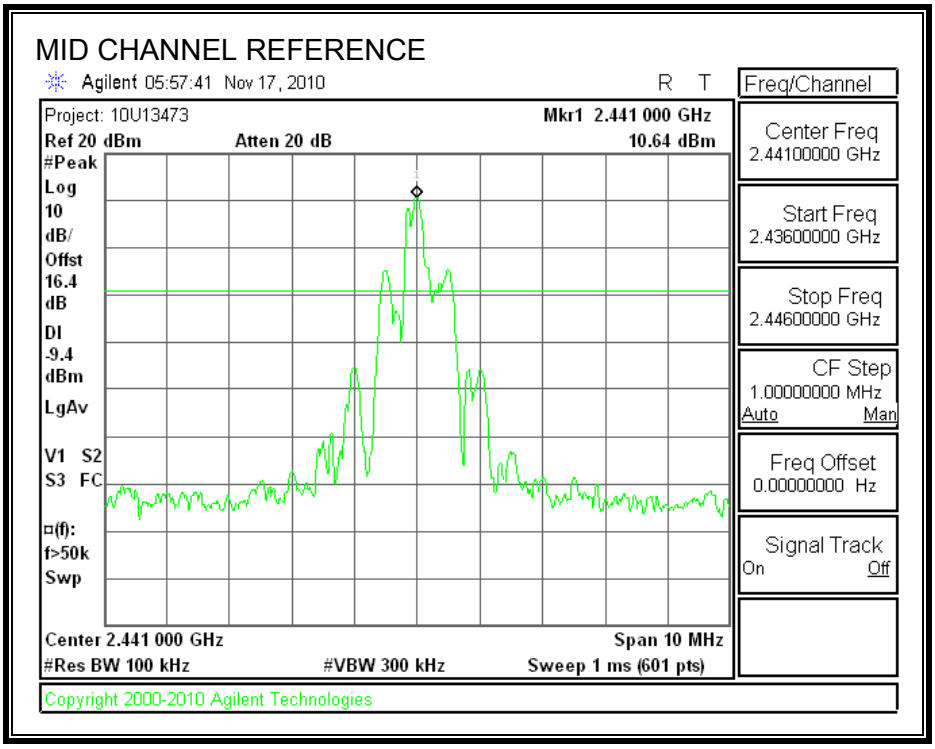
RESULTS

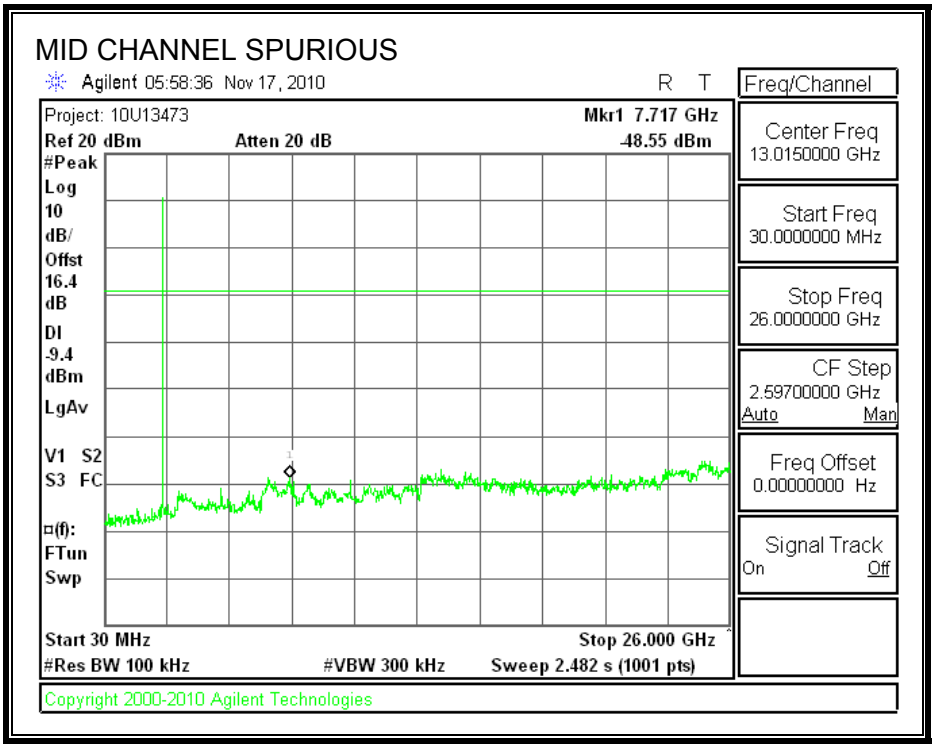
SPURIOUS EMISSIONS, LOW CHANNEL



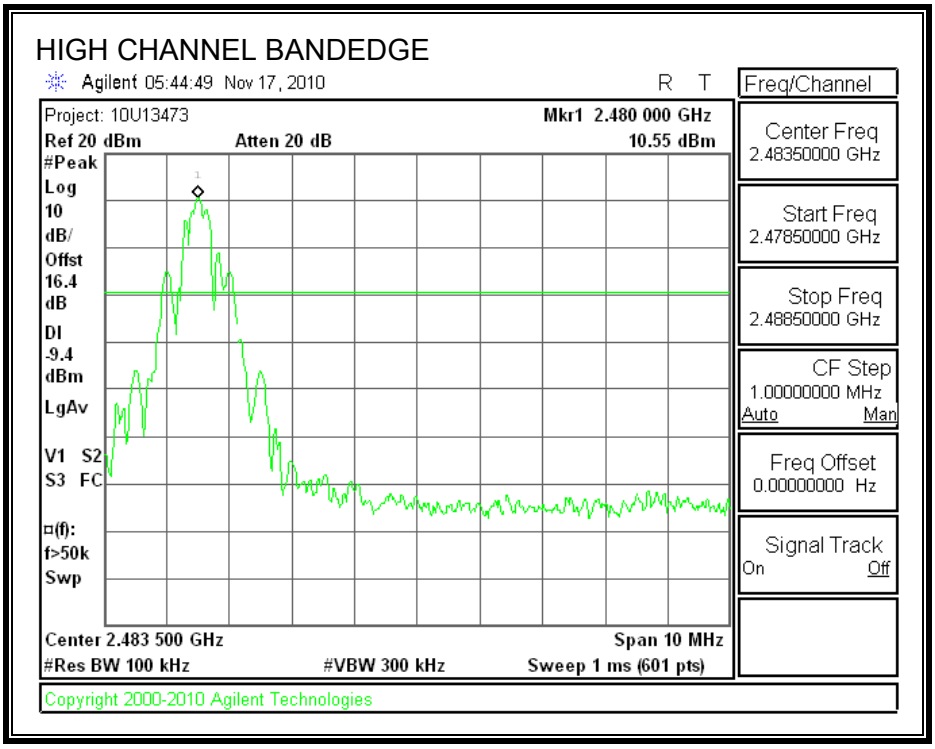


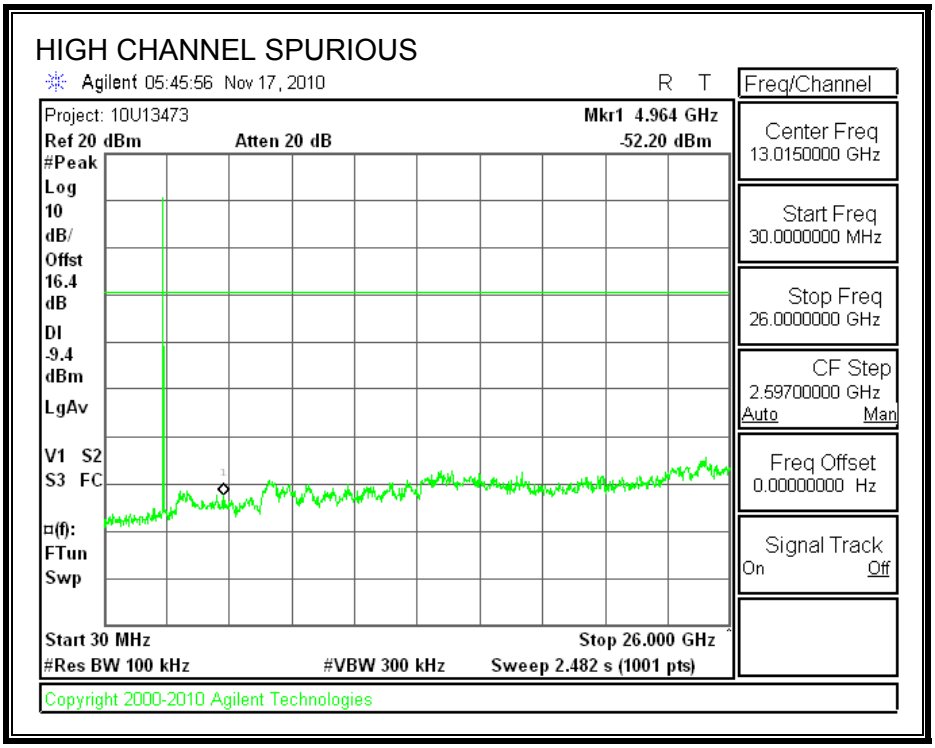
SPURIOUS EMISSIONS, MID CHANNEL





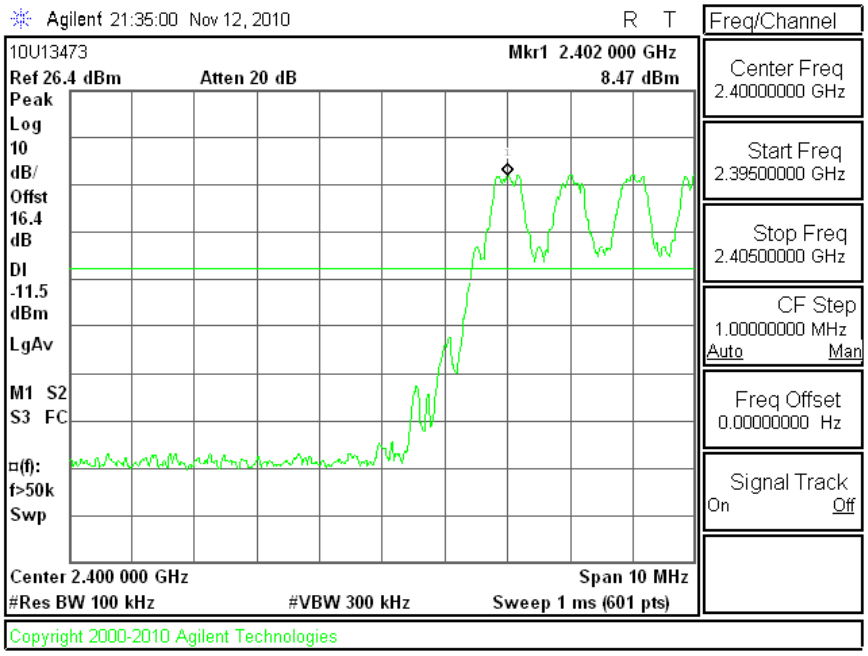
SPURIOUS EMISSIONS, HIGH CHANNEL



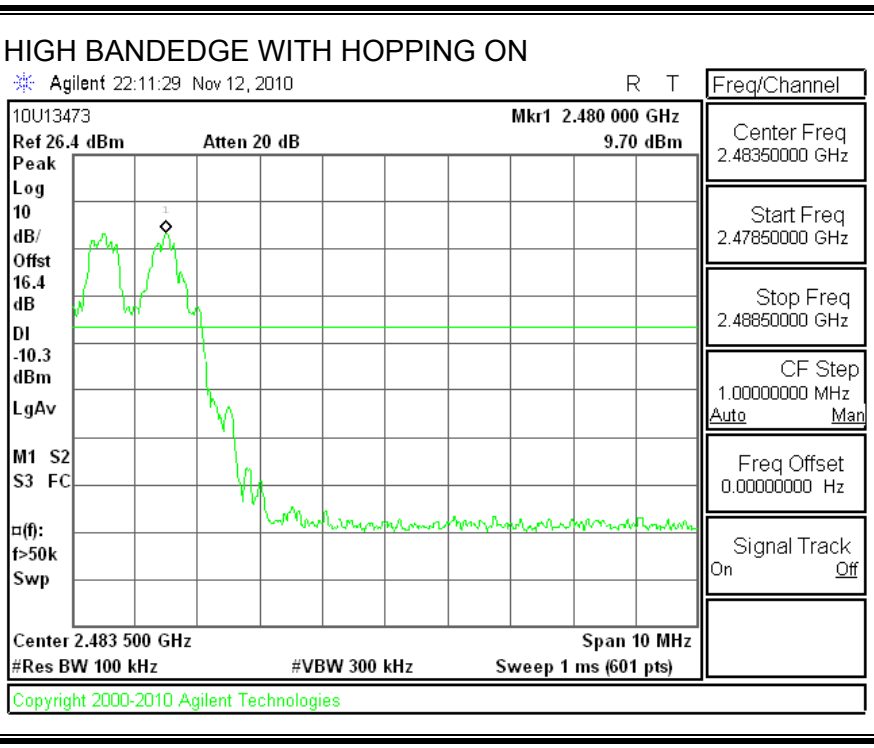


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



7.2. ENHANCED DATA RATE QPSK MODULATION

7.2.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

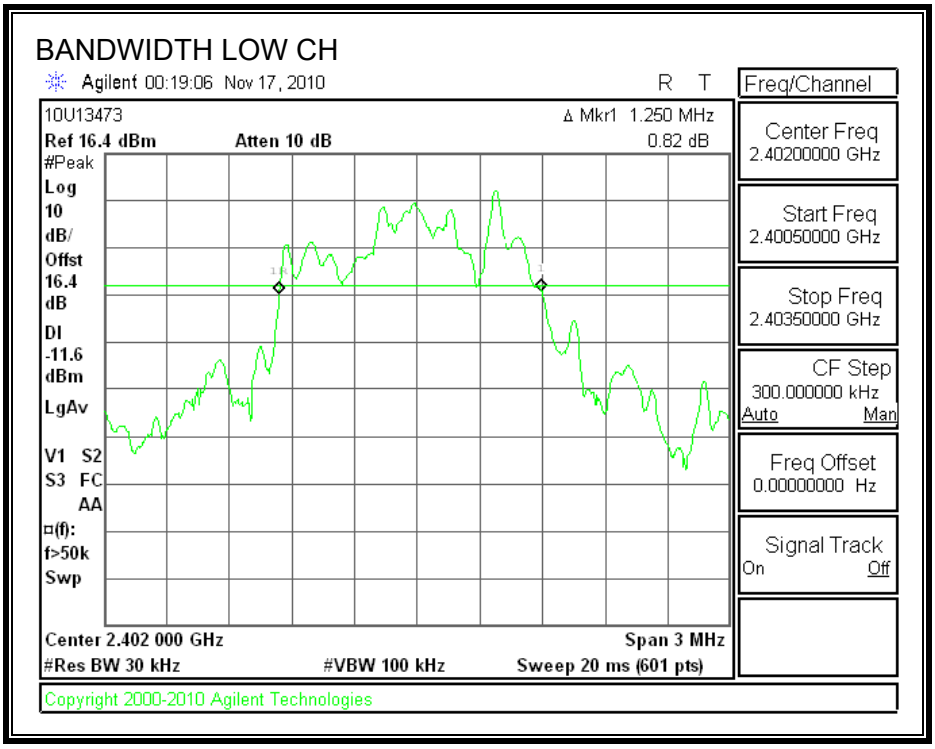
TEST PROCEDURE

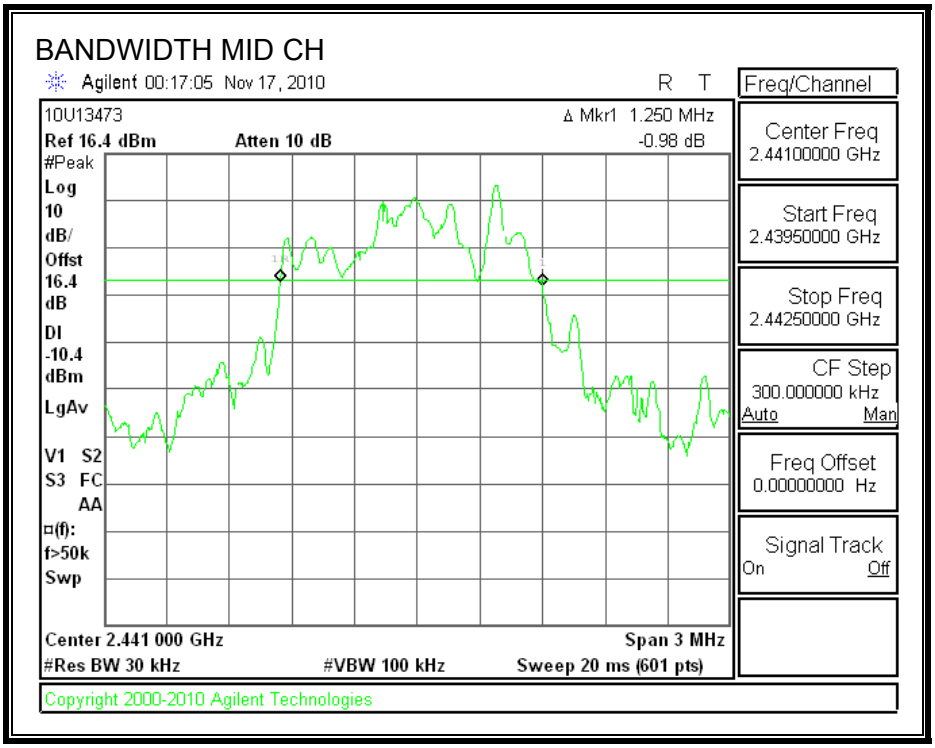
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

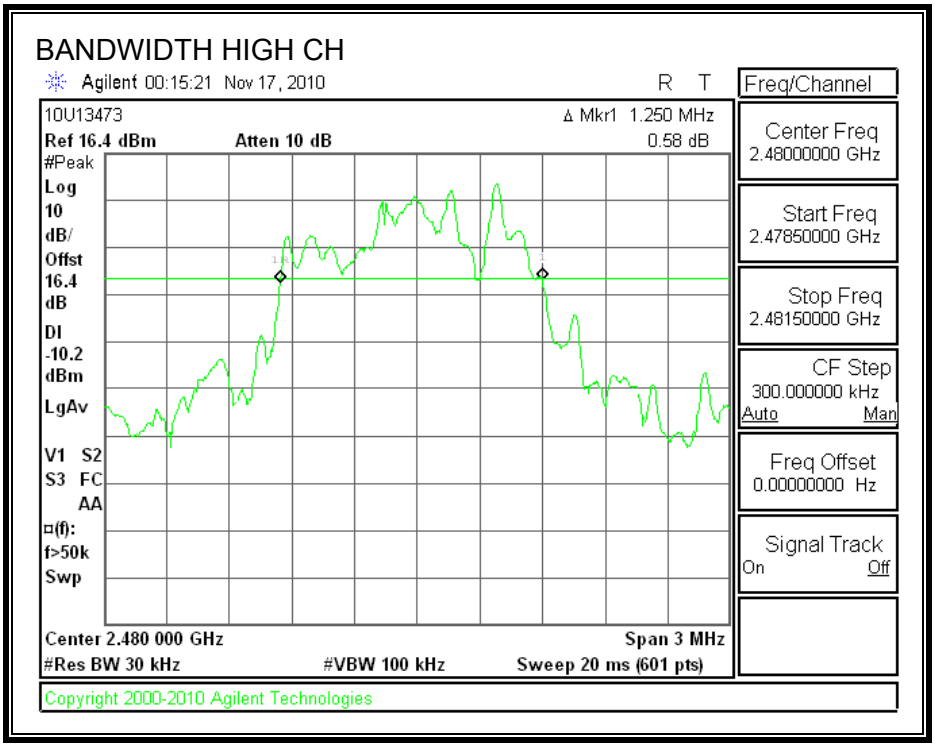
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.250	1.0525
Middle	2441	1.250	1.0513
High	2480	1.250	1.0512

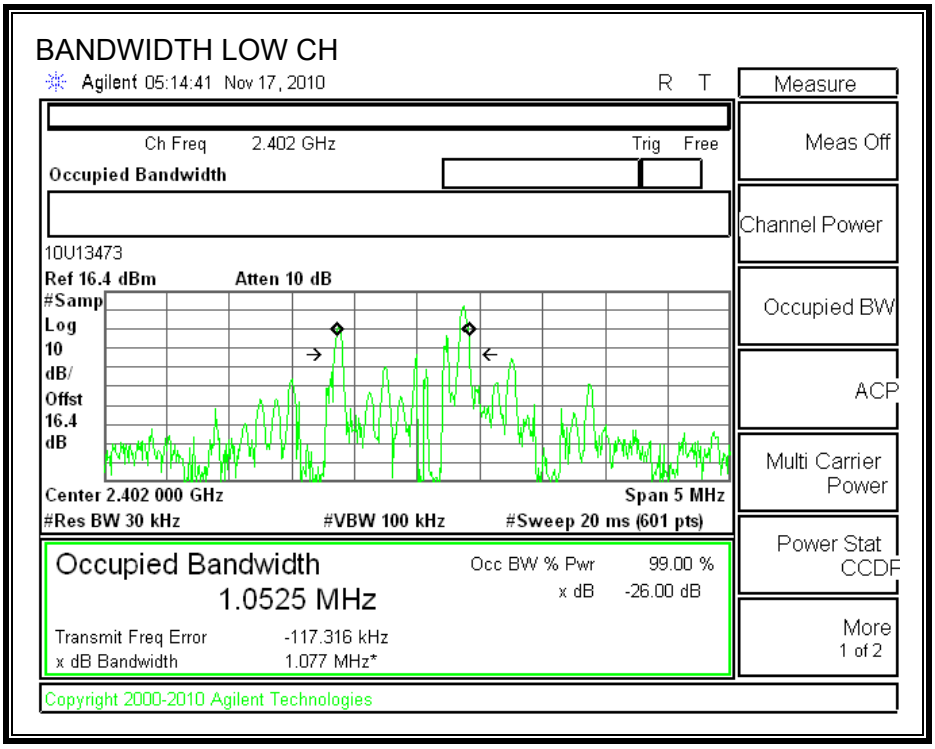
20 dB BANDWIDTH

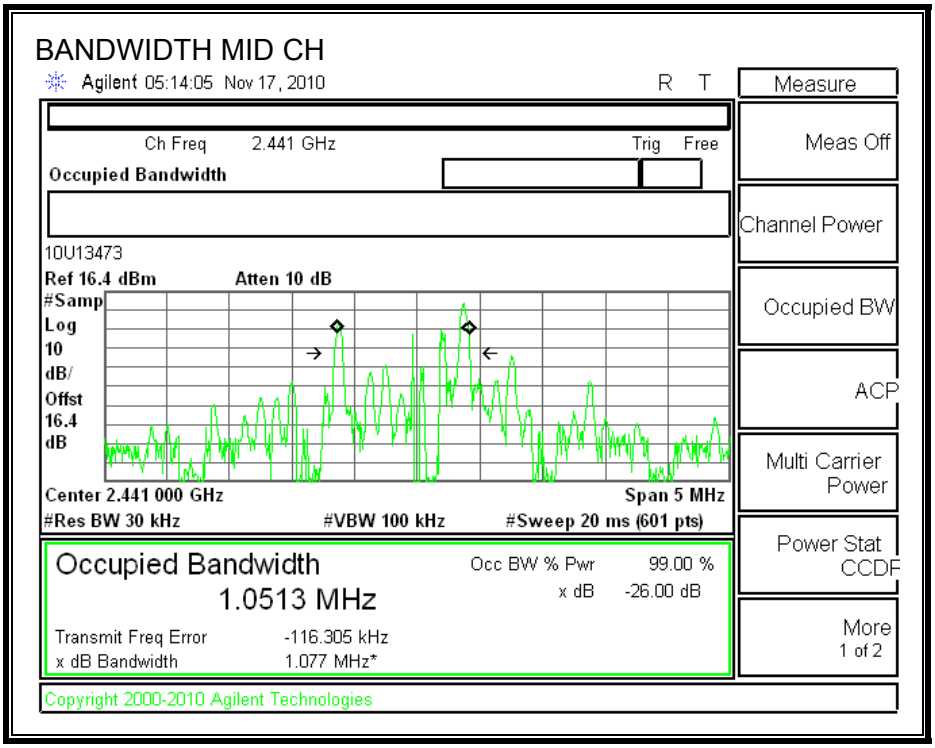


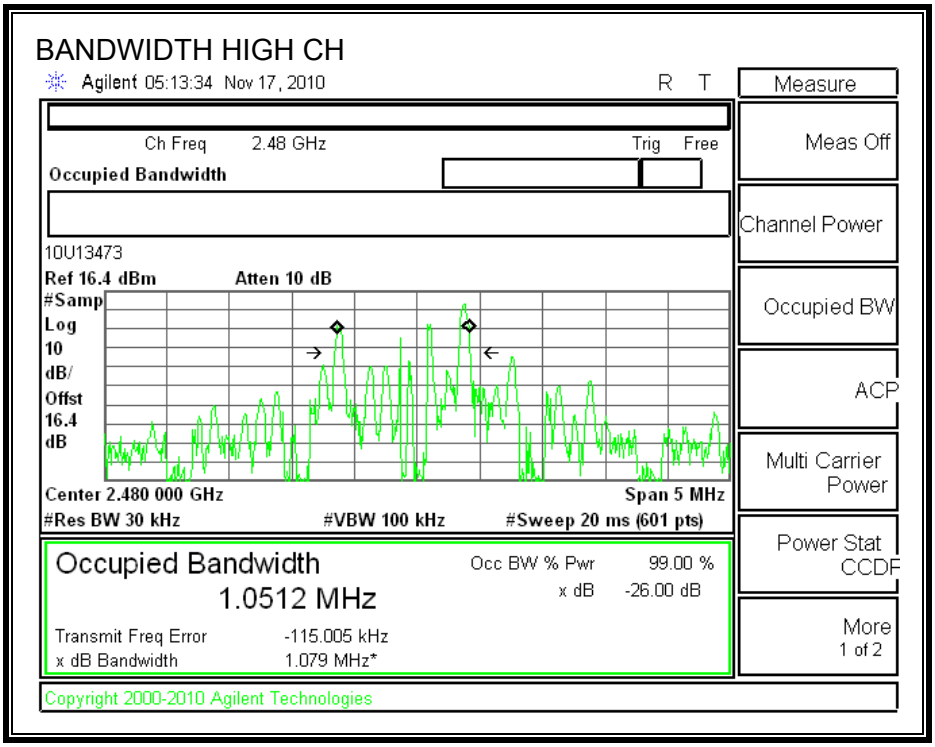




99% BANDWIDTH







7.2.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

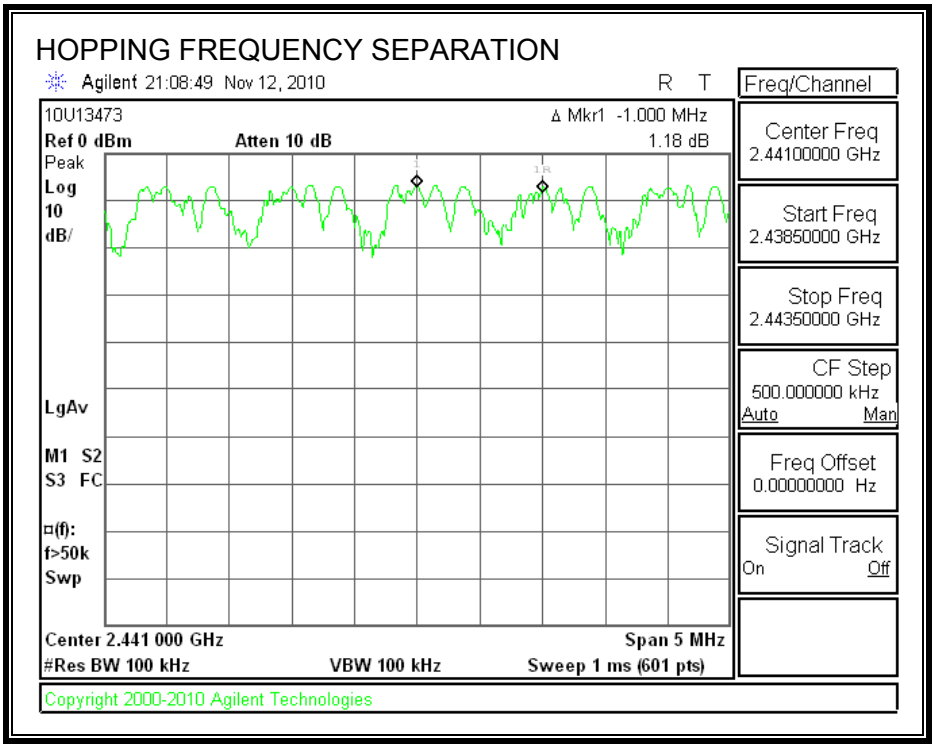
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



7.2.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

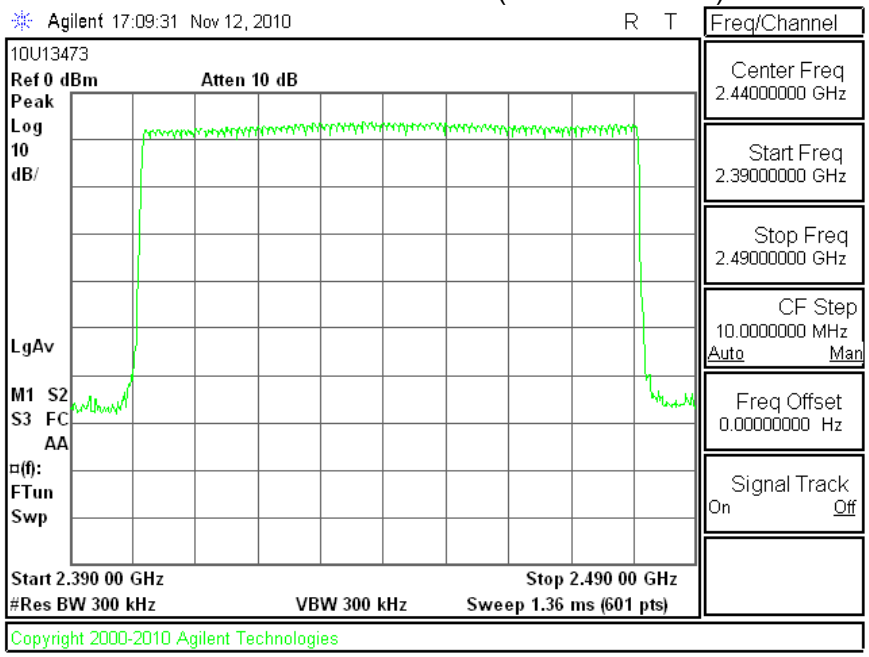
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

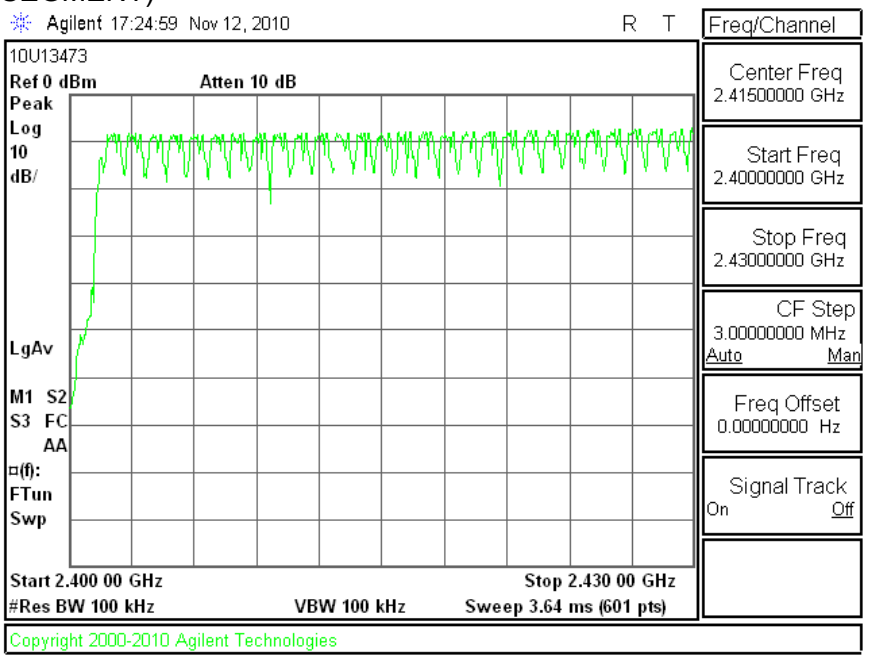
79 Channels observed.

NUMBER OF HOPPING CHANNELS

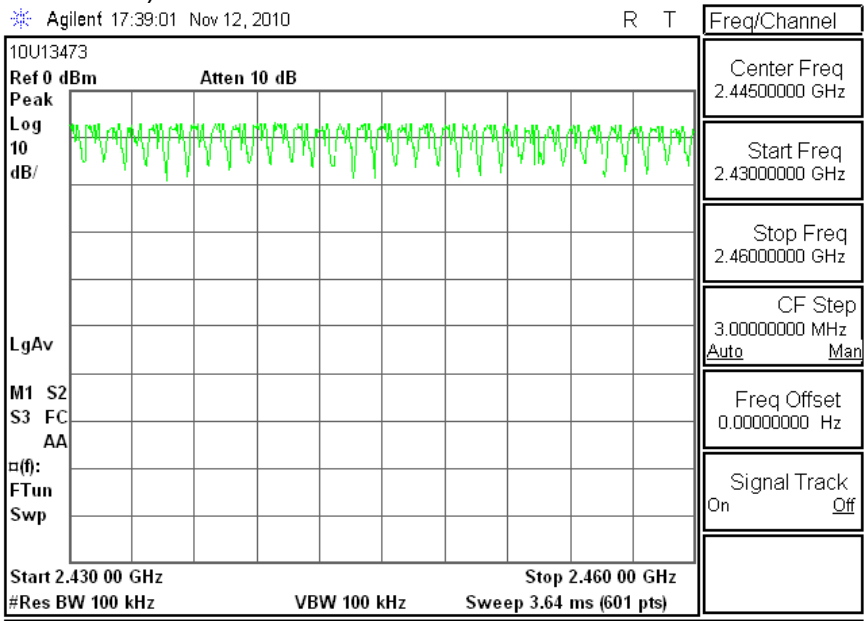
NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



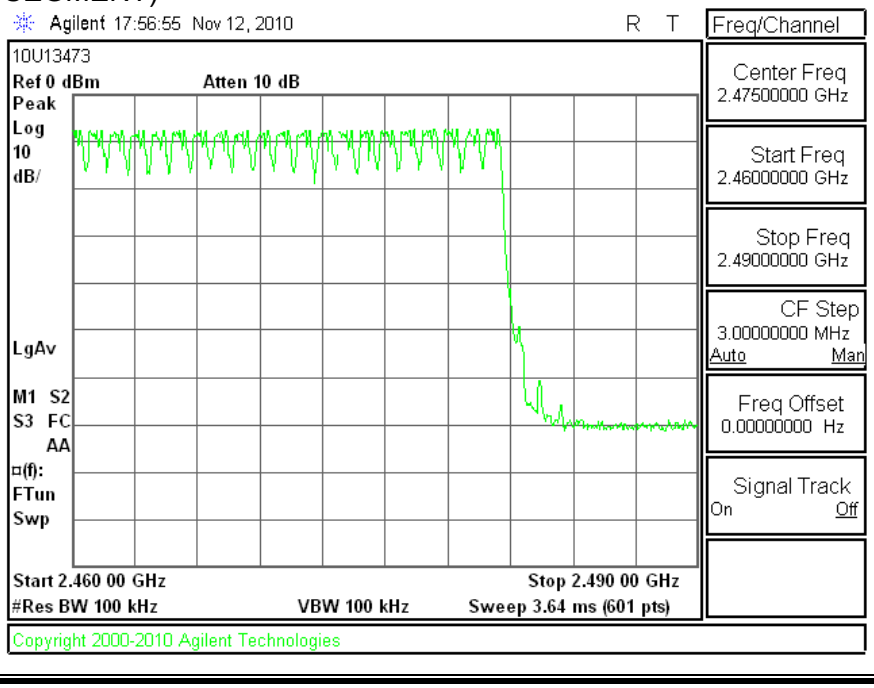
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, THIRD SEGMENT)



7.2.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

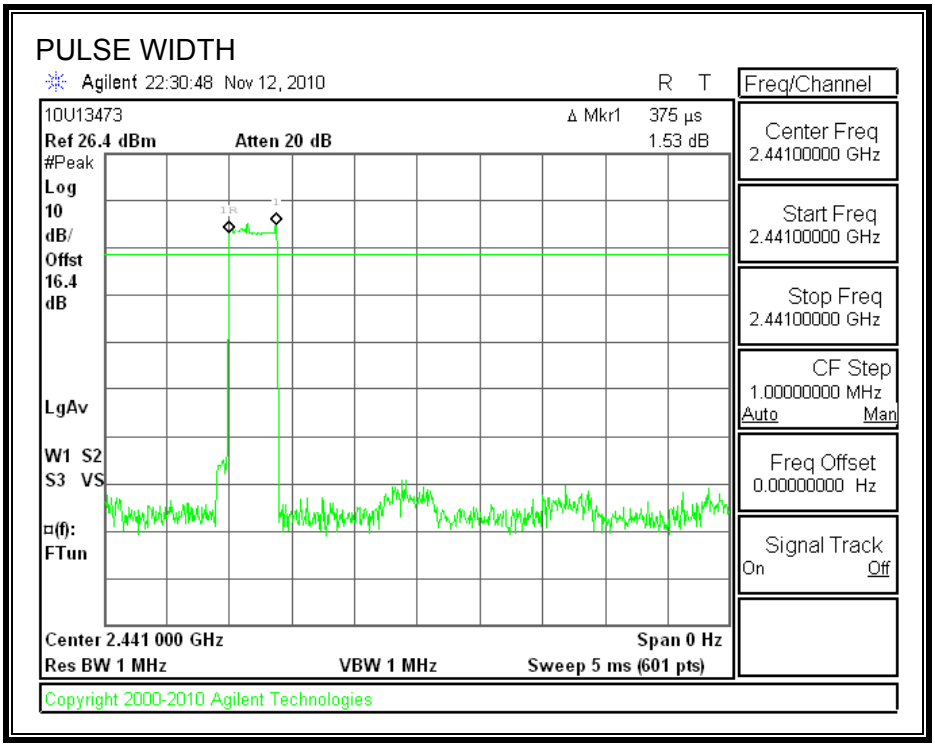
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

RESULTS

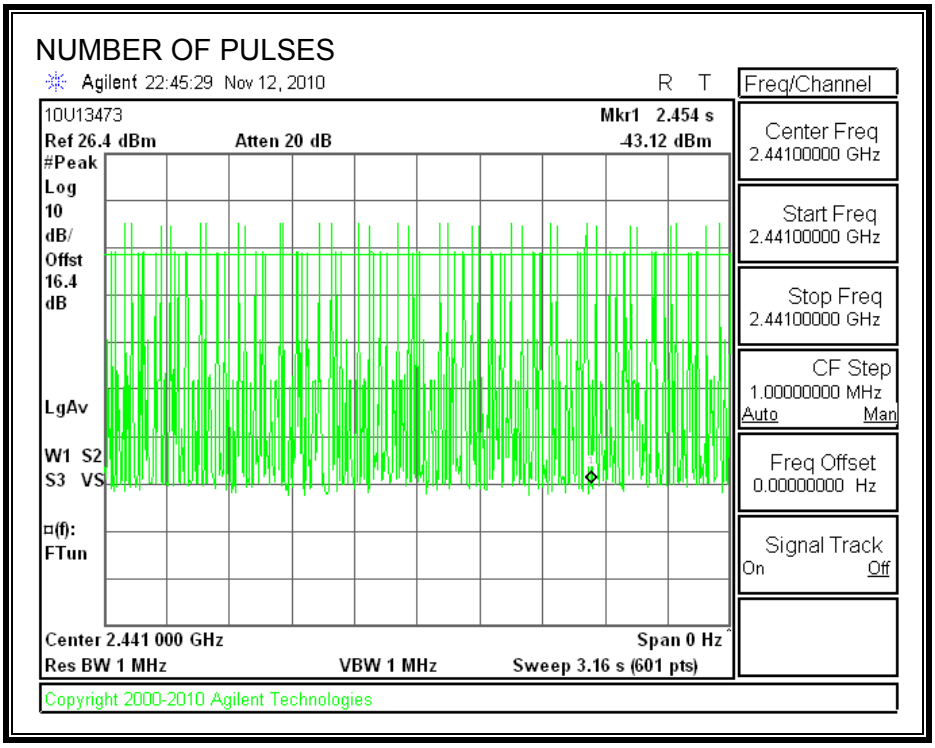
QPSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.375	33	0.124	0.4	0.276
DH3	1.625	16	0.260	0.4	0.140
DH5	2.892	10	0.289	0.4	0.111

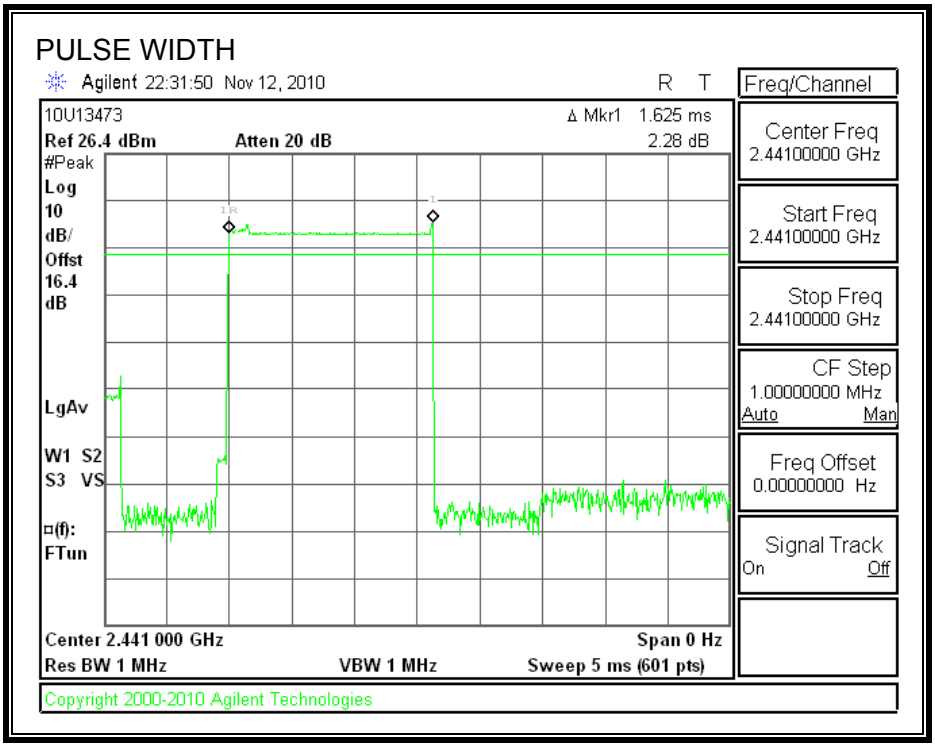
PULSE WIDTH QPSK DH1



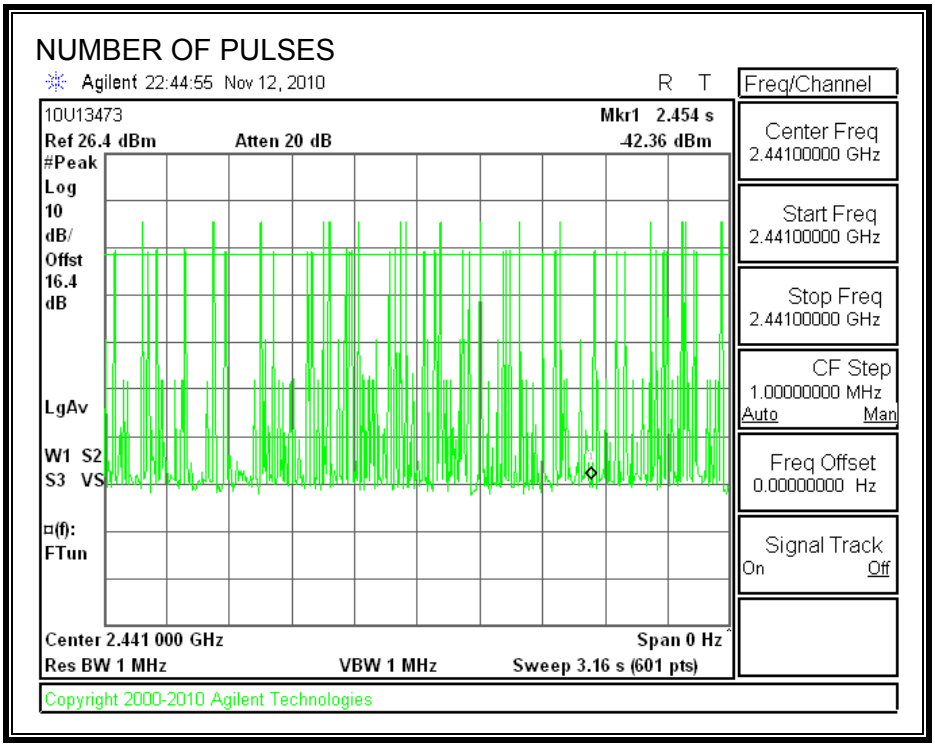
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



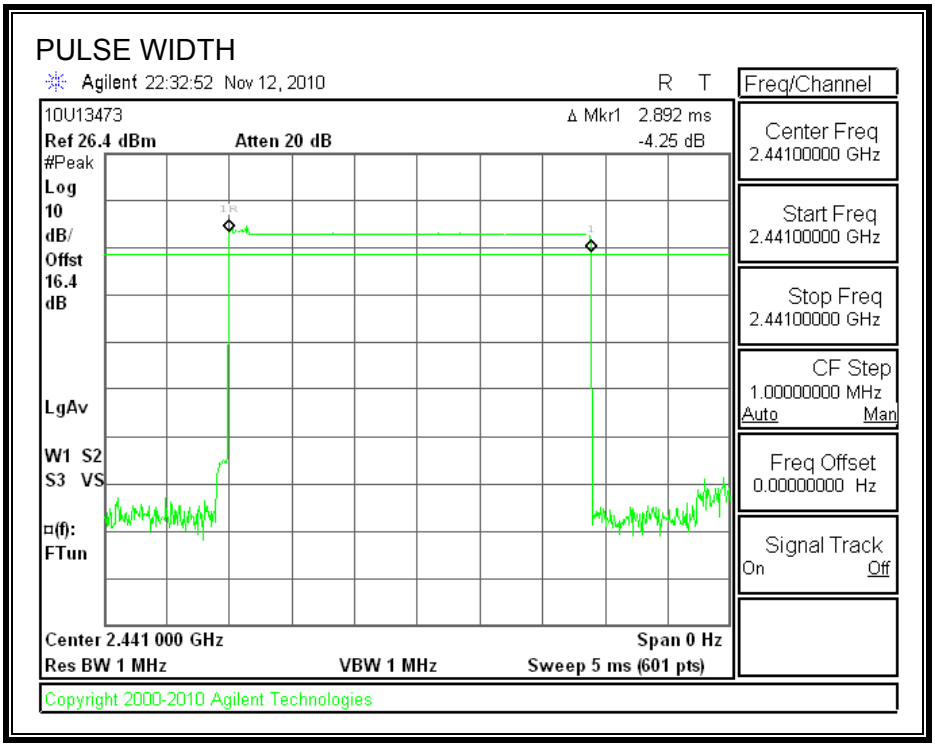
PULSE WIDTH QPSK DH3



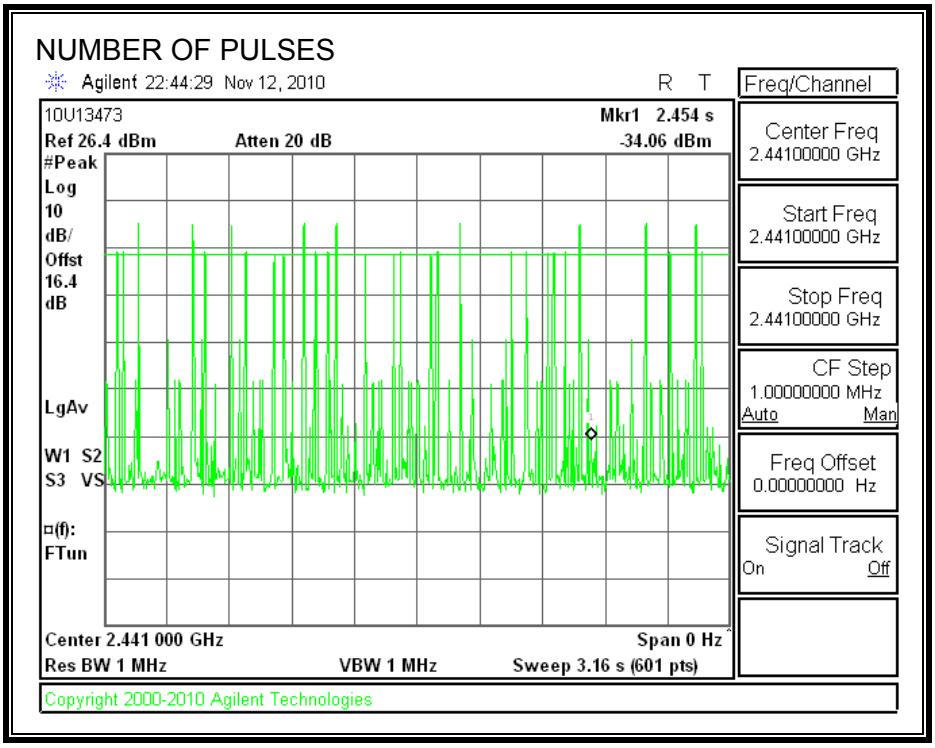
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



PULSE WIDTH QPSK DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.2.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

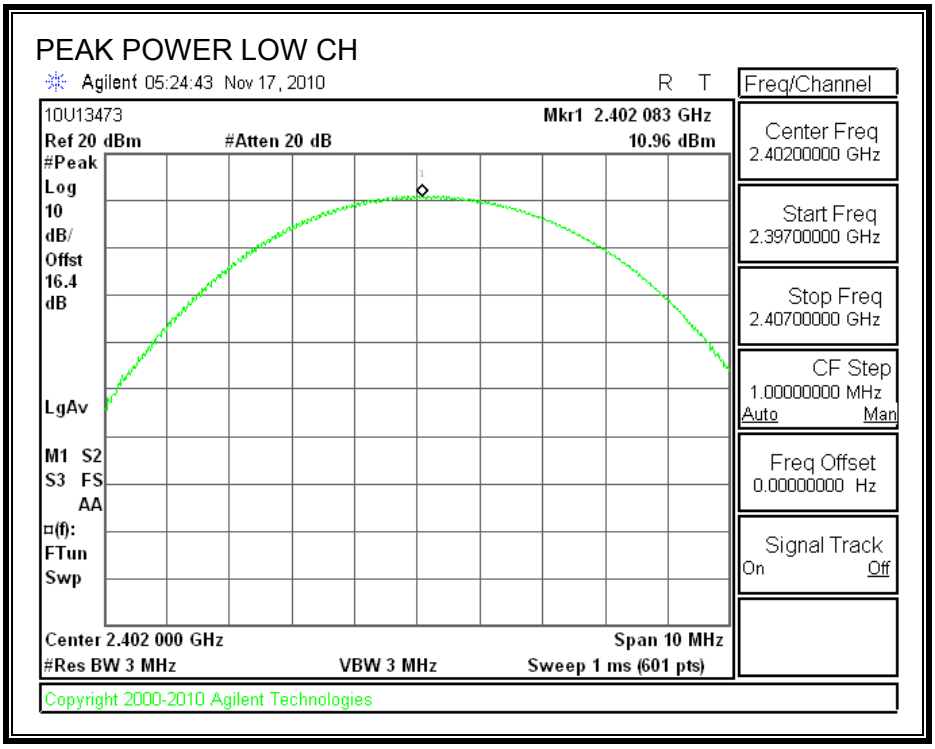
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

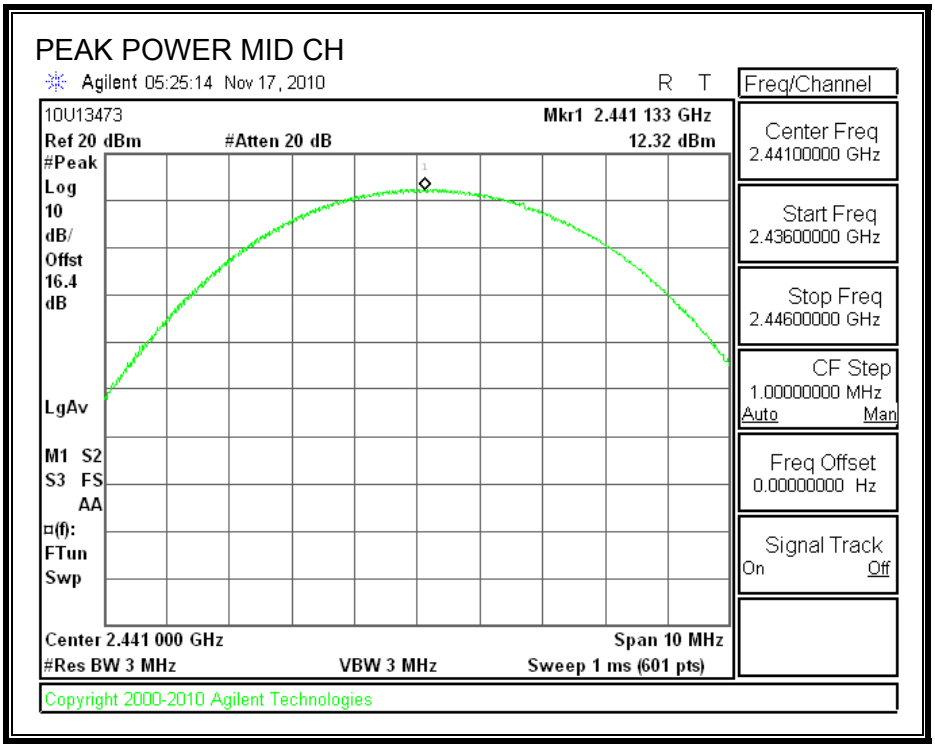
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.96	21	-10.04
Middle	2441	12.32	21	-8.68
High	2480	12.23	21	-8.77

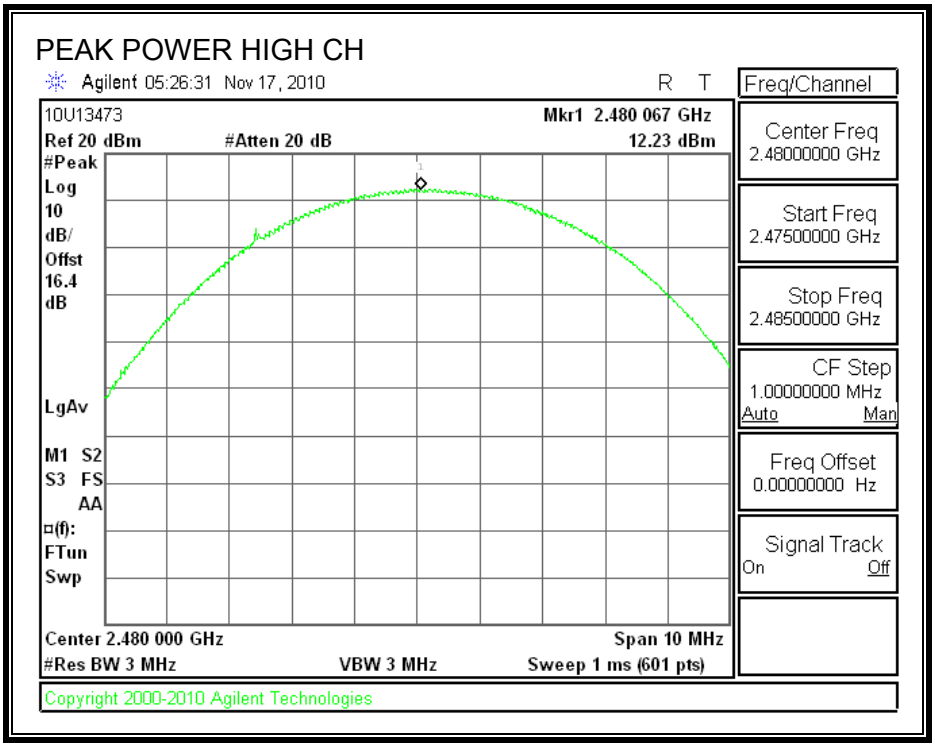
OUTPUT POWER

PEAK POWER LOW CH



PEAK POWER MID CH





7.2.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.4 dB (including 10 dB pad and 0.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.70
Middle	2441	9.40
High	2480	9.70

7.2.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

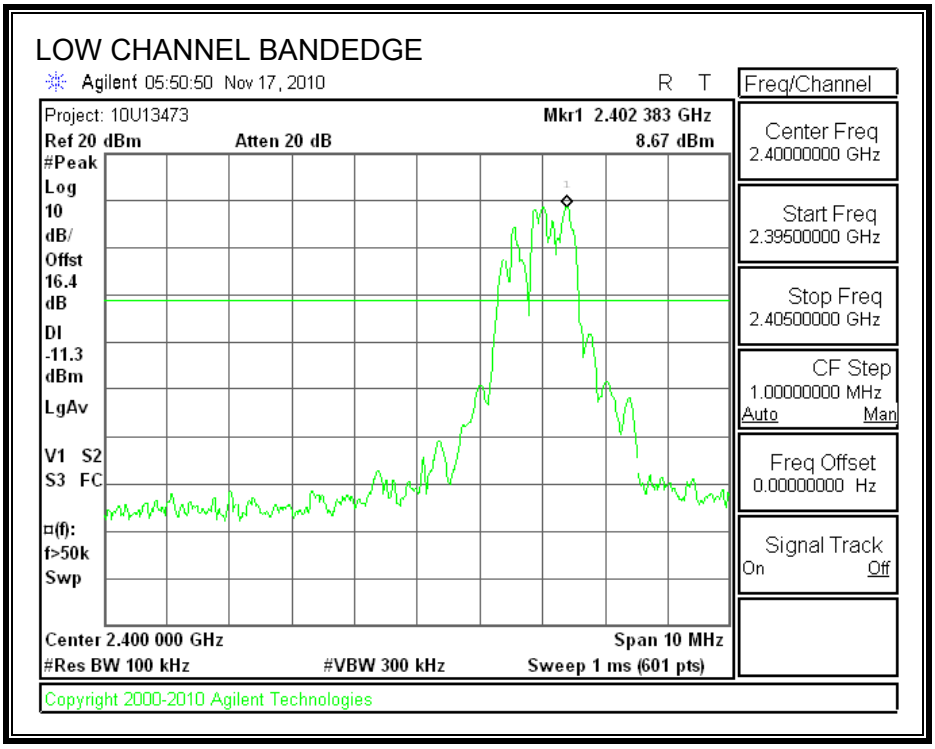
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

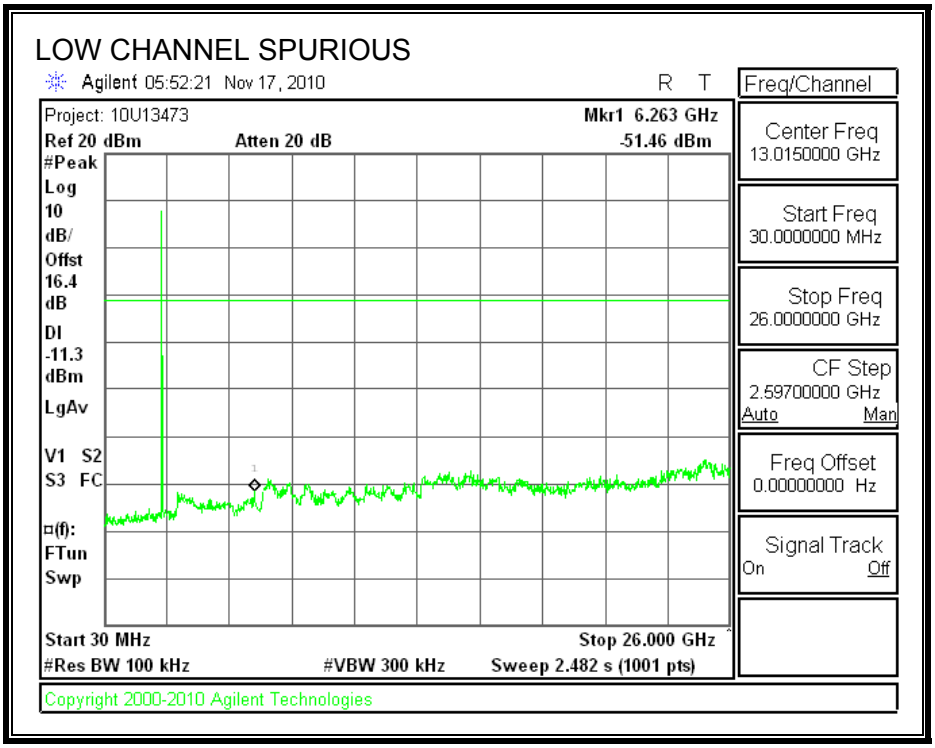
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

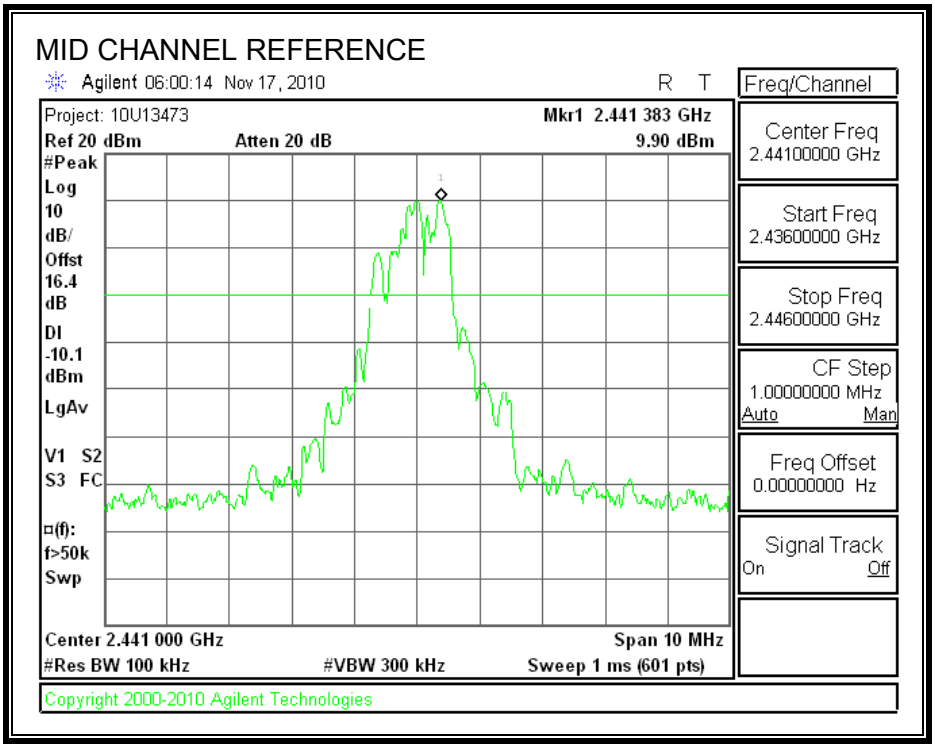
RESULTS

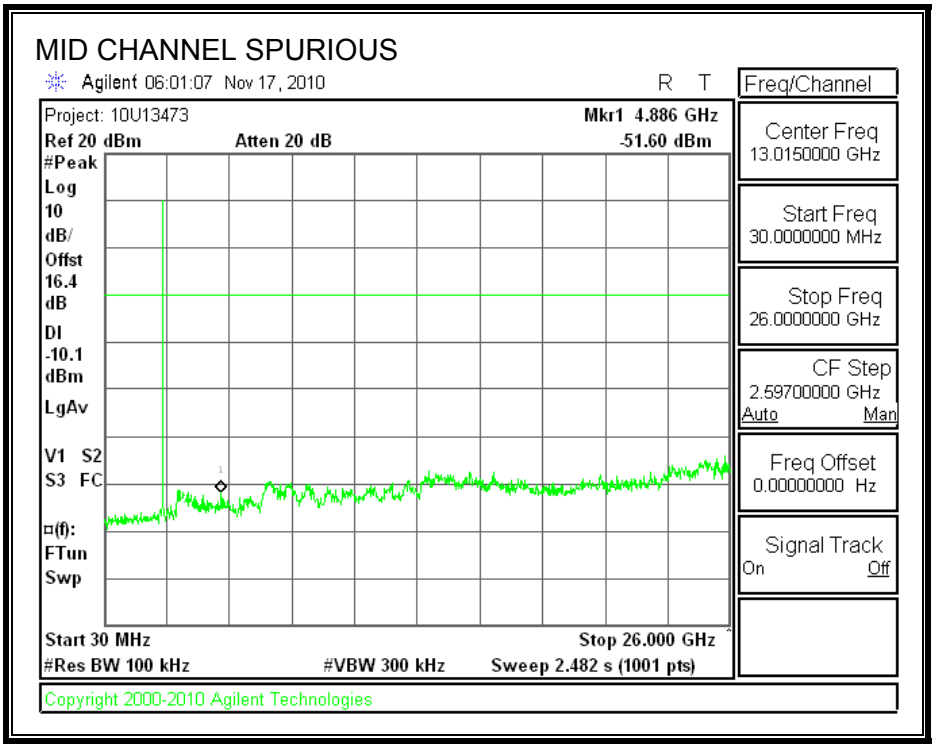
SPURIOUS EMISSIONS, LOW CHANNEL



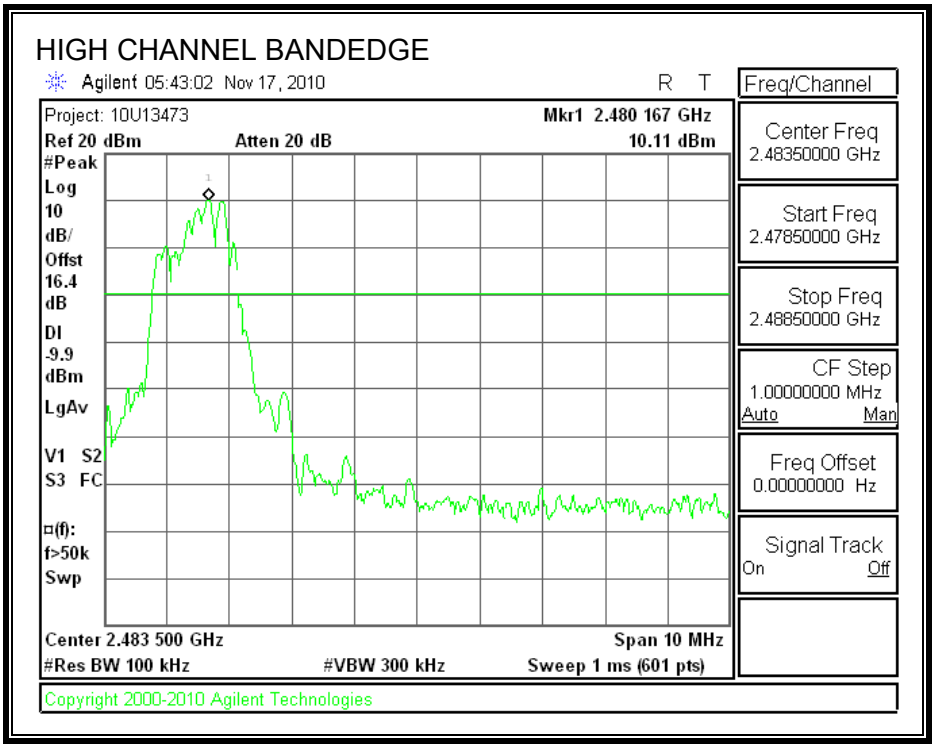


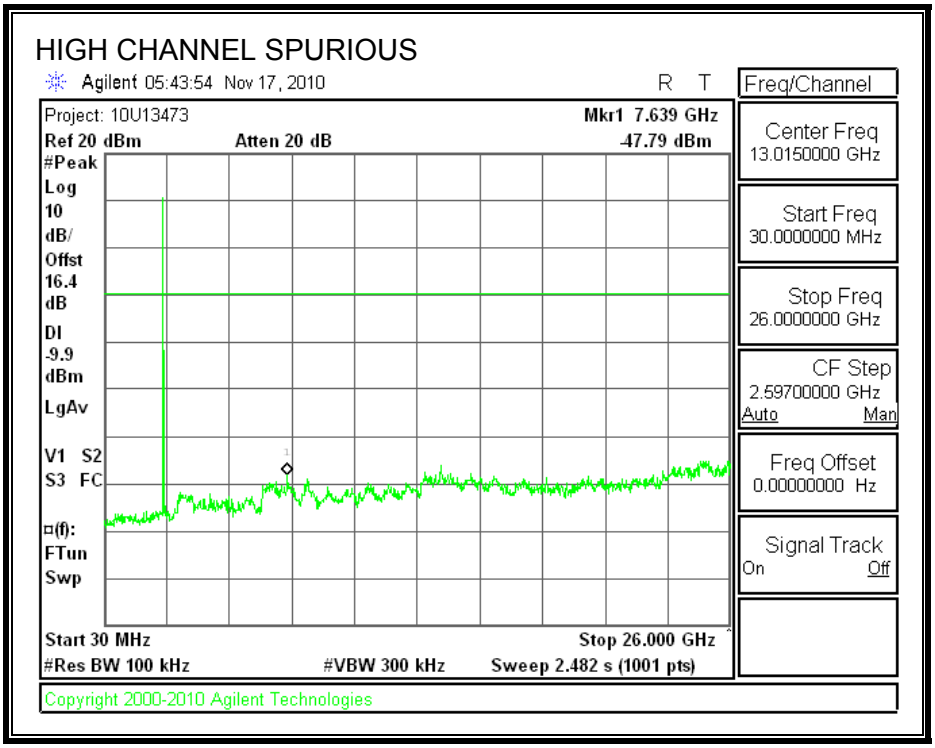
SPURIOUS EMISSIONS, MID CHANNEL





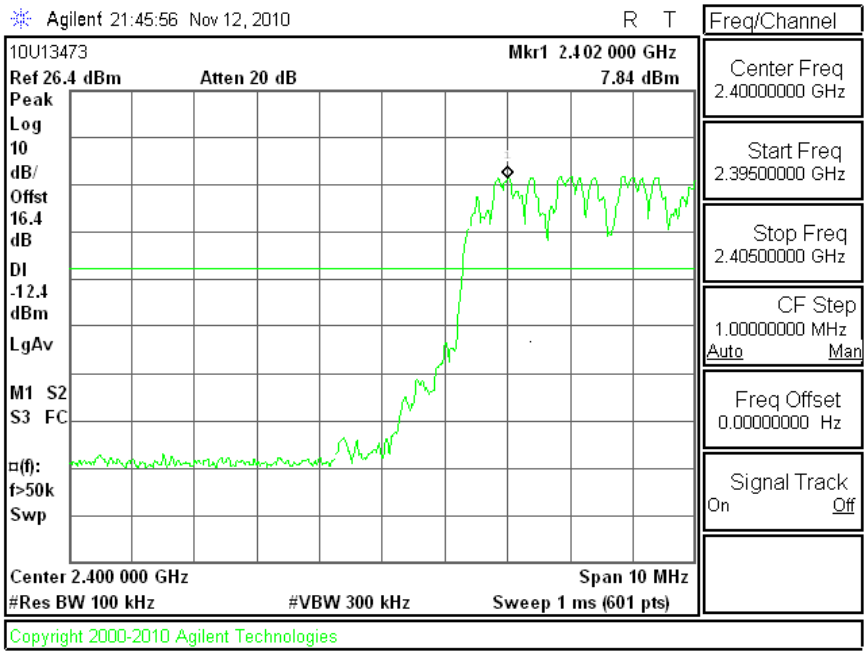
SPURIOUS EMISSIONS, HIGH CHANNEL



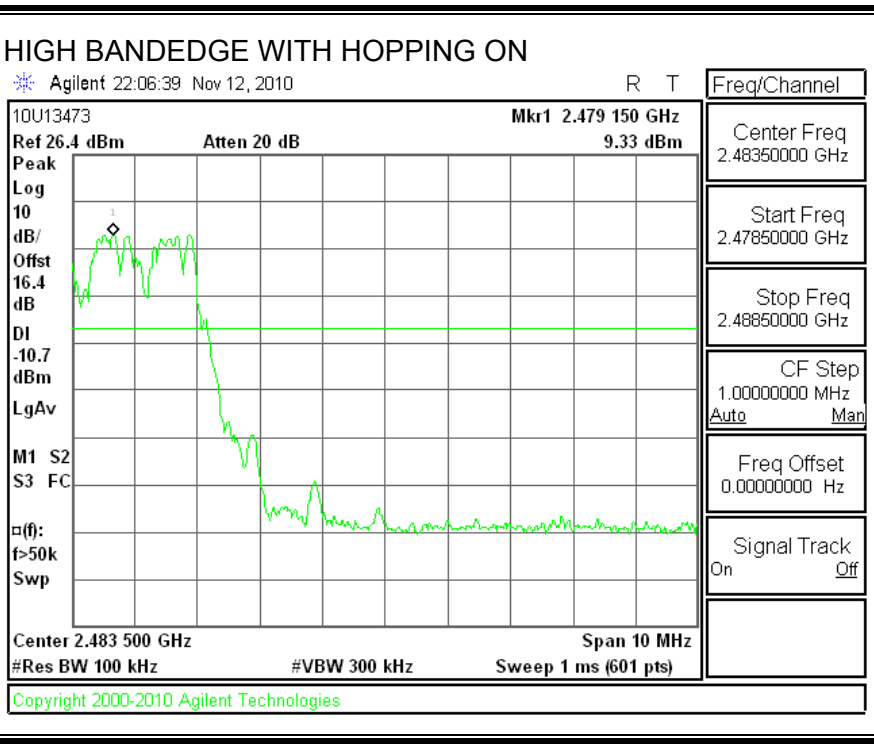


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



7.3. ENHANCED DATA RATE 8PSK MODULATION

7.3.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

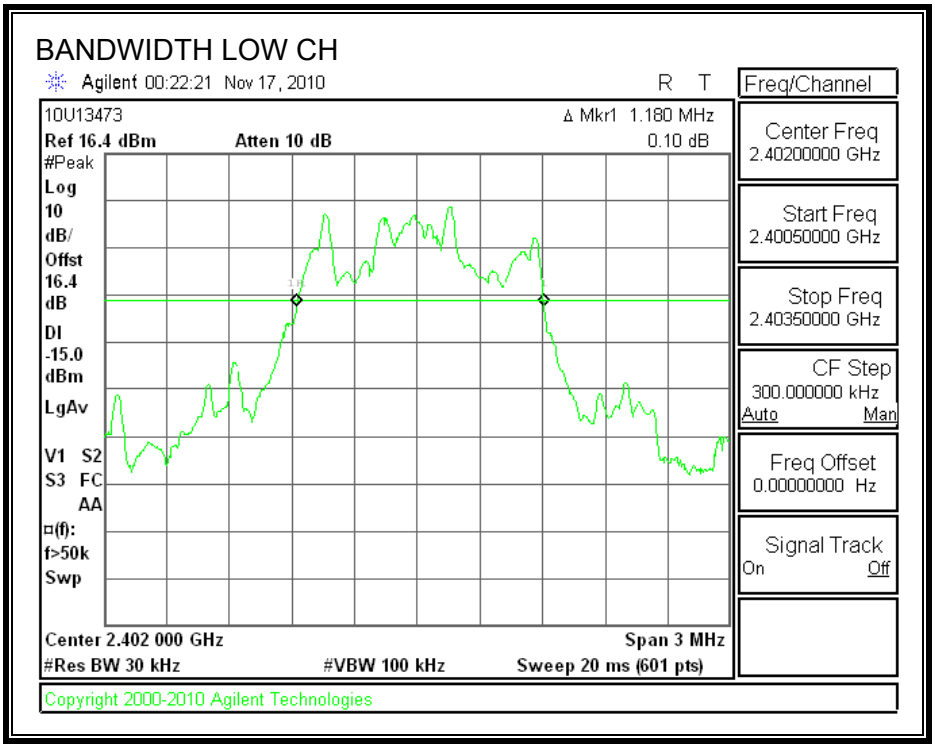
TEST PROCEDURE

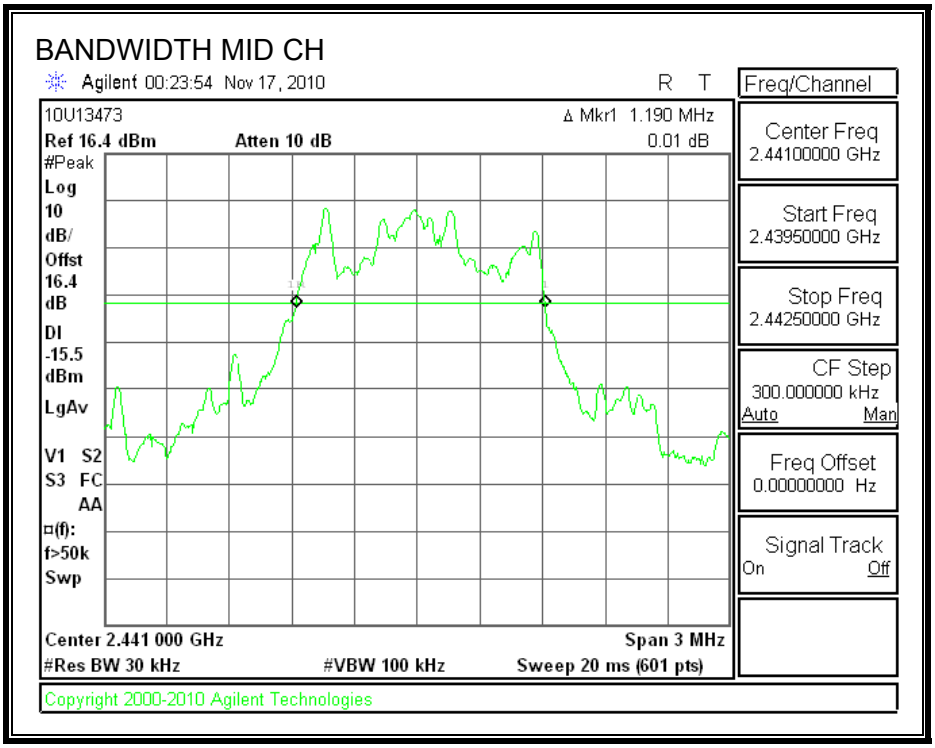
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

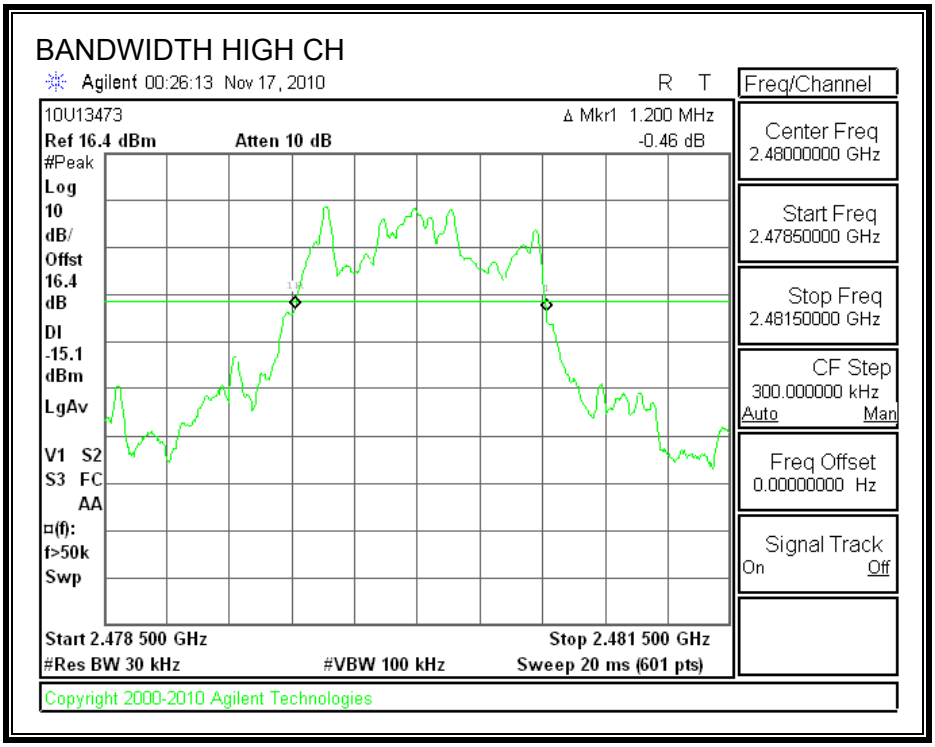
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.180	1.0524
Middle	2441	1.190	1.0579
High	2480	1.200	1.0550

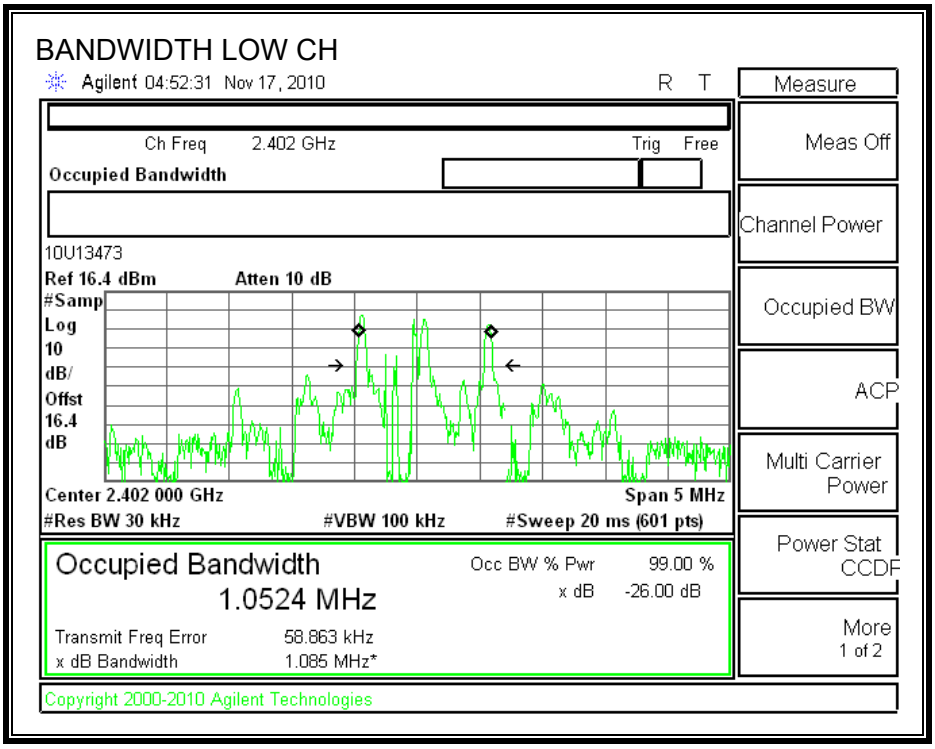
20 dB BANDWIDTH

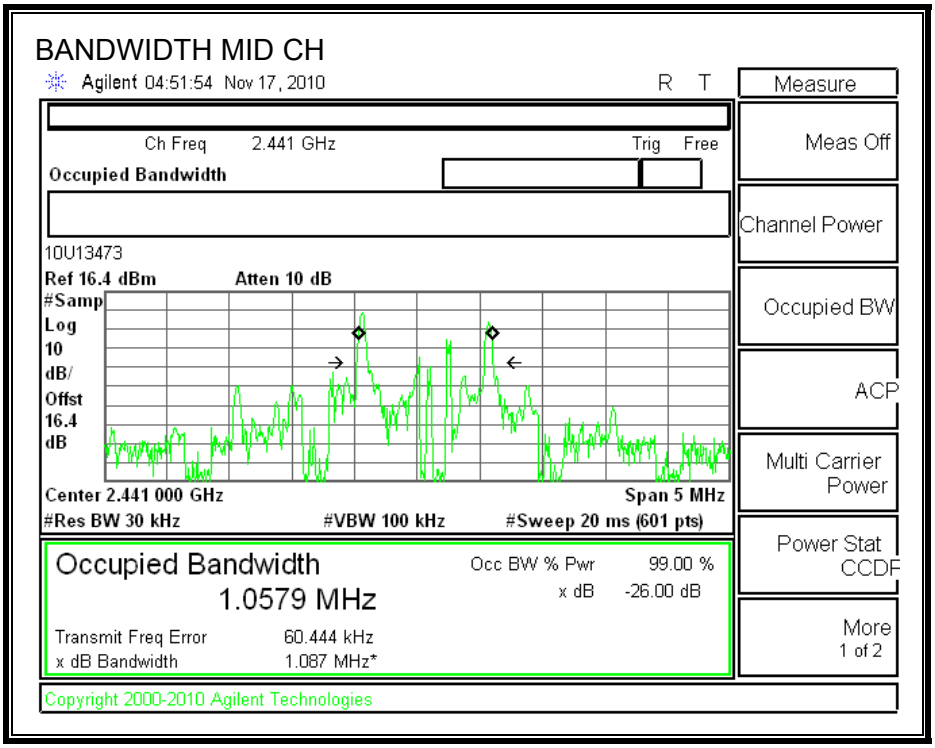


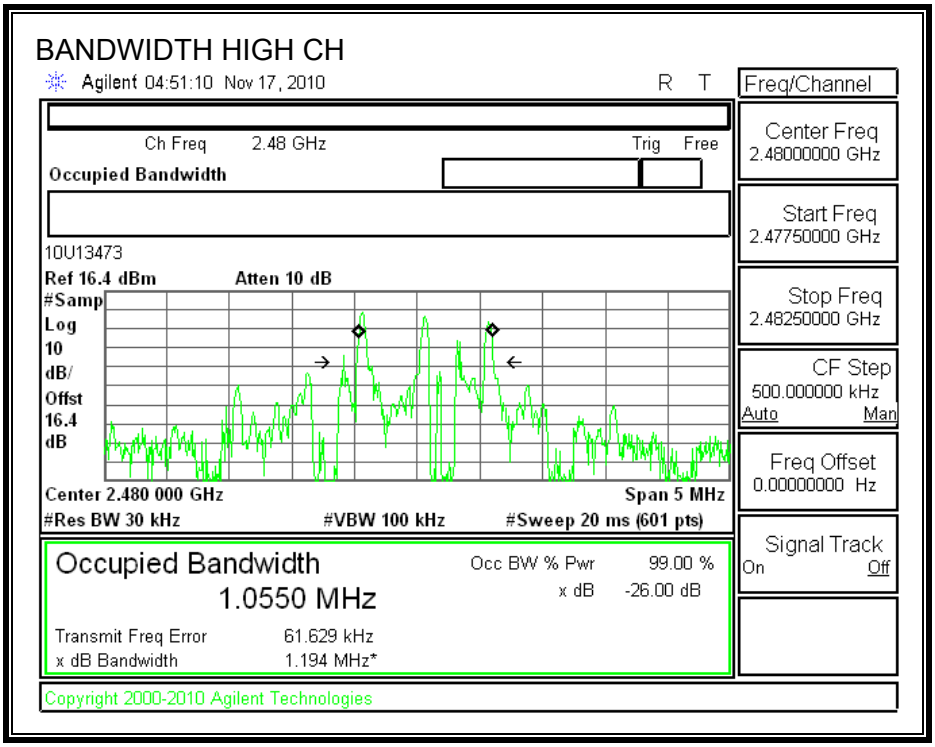




99% BANDWIDTH







7.3.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

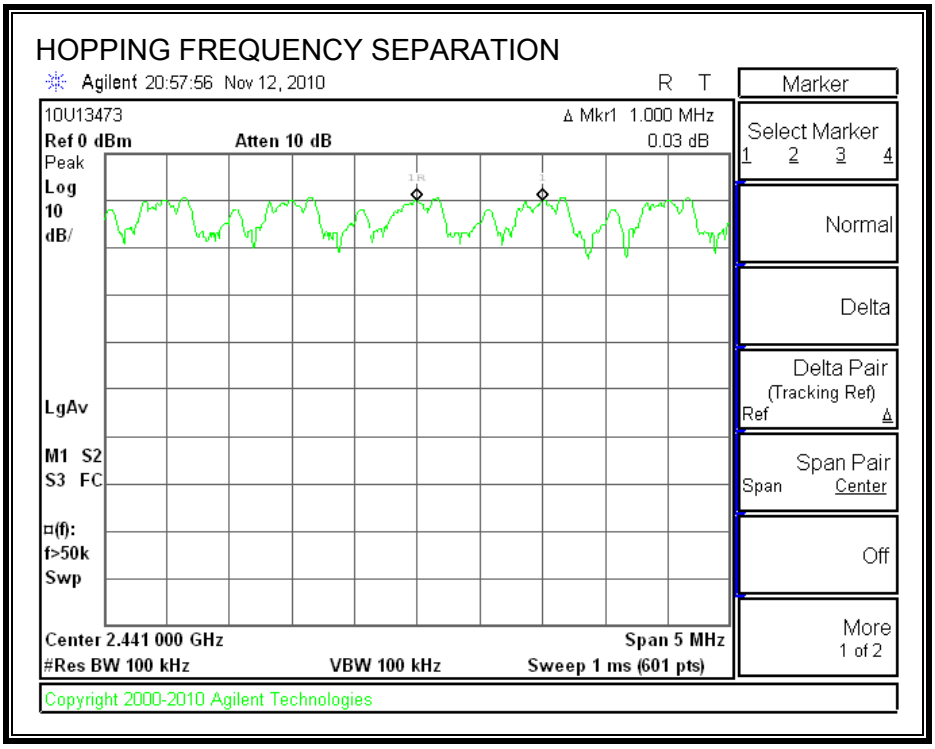
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



7.3.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

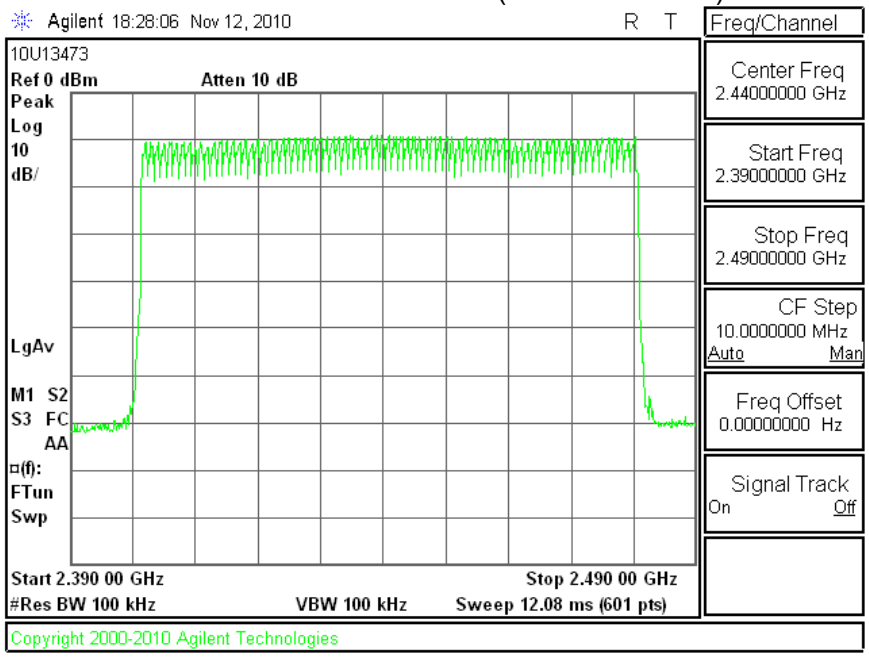
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

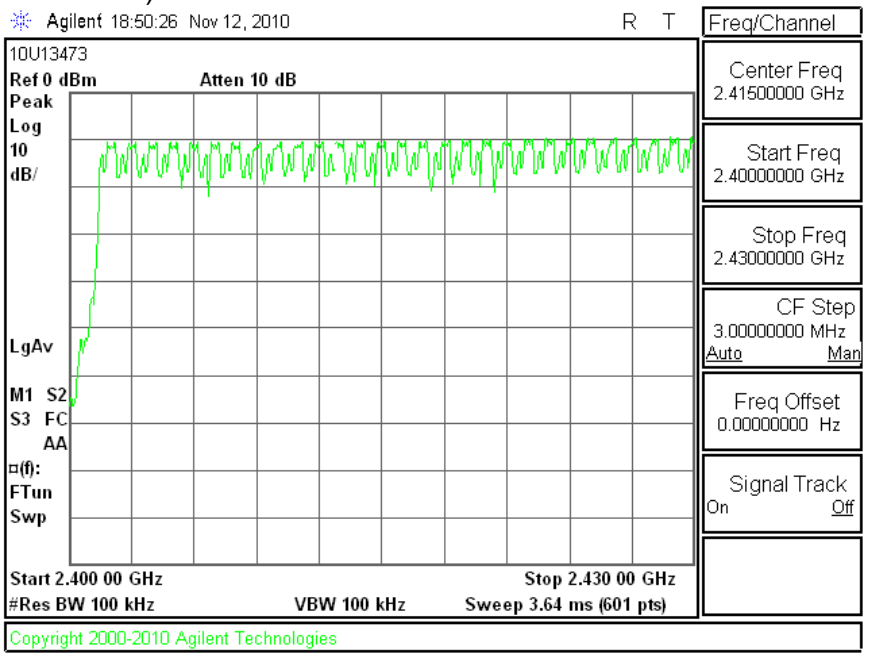
79 Channels observed.

NUMBER OF HOPPING CHANNELS

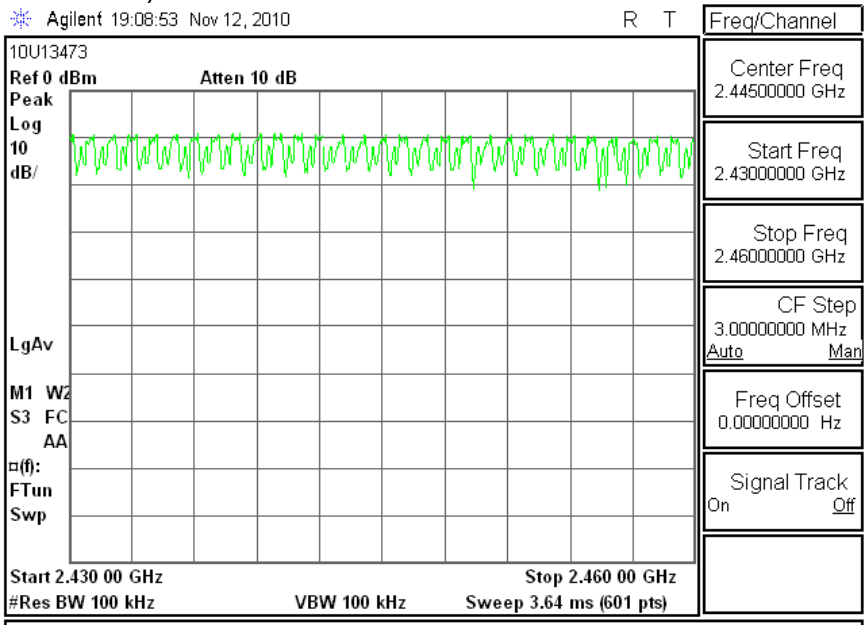
NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



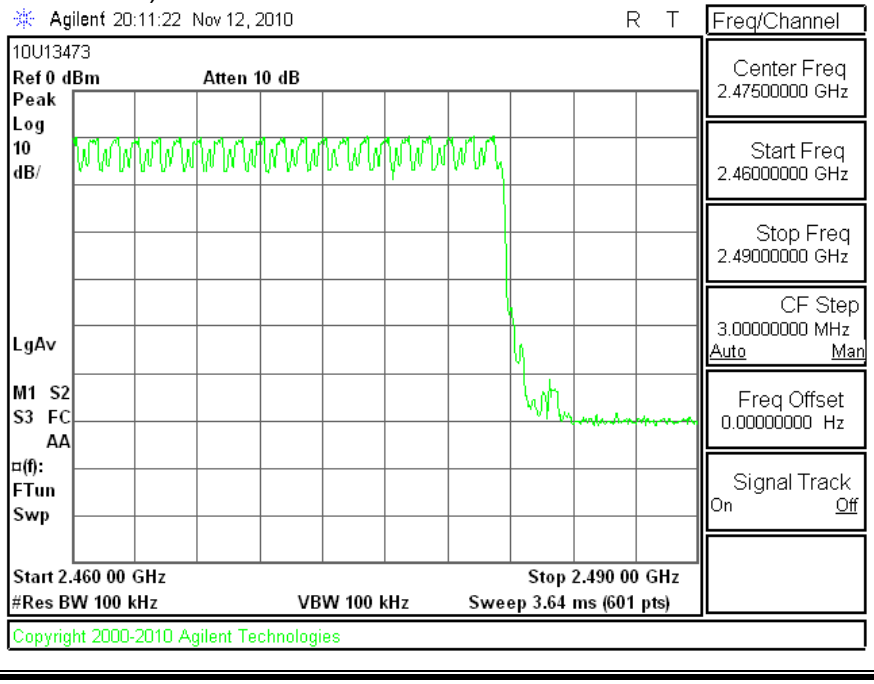
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, THIRD SEGMENT)



7.3.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

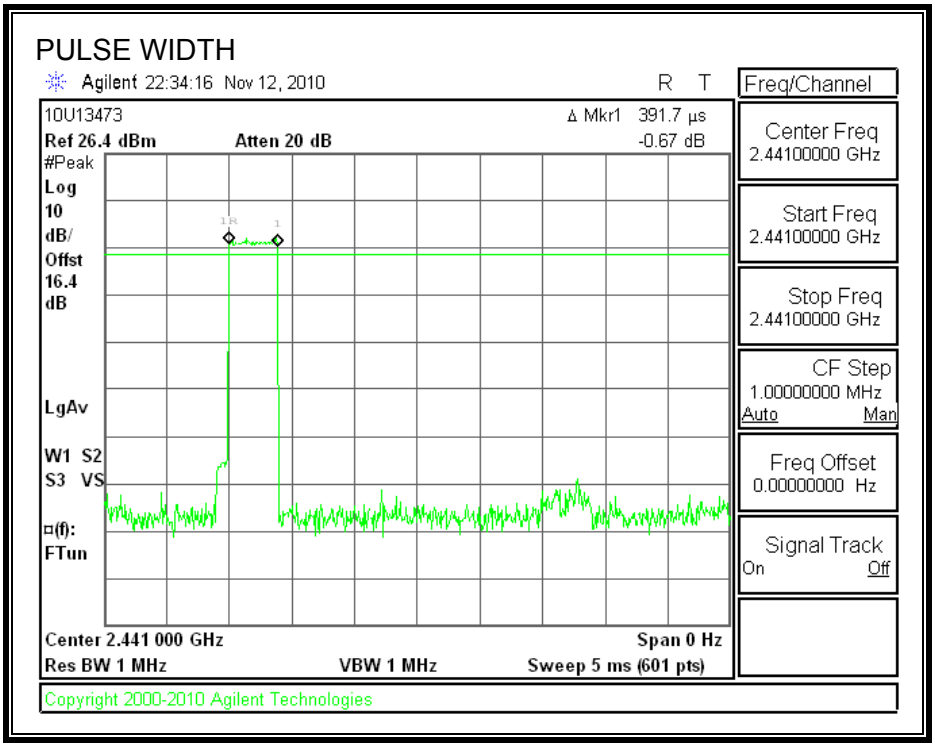
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

RESULTS

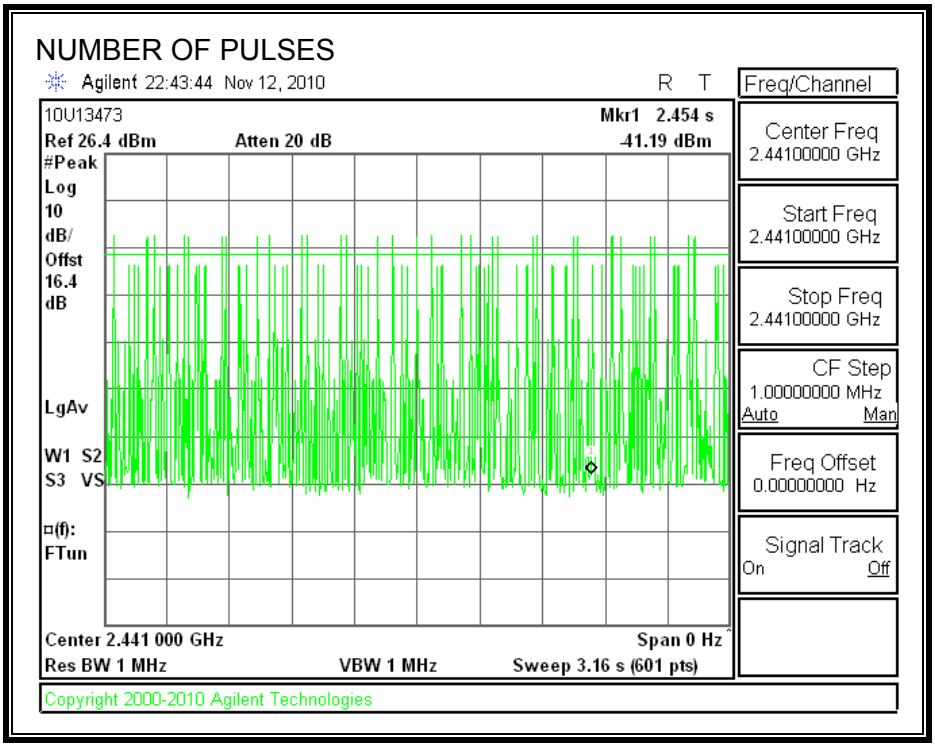
8PSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.3917	31	0.121	0.4	0.279
DH3	1.642	17	0.279	0.4	0.121
DH5	2.892	10	0.289	0.4	0.111

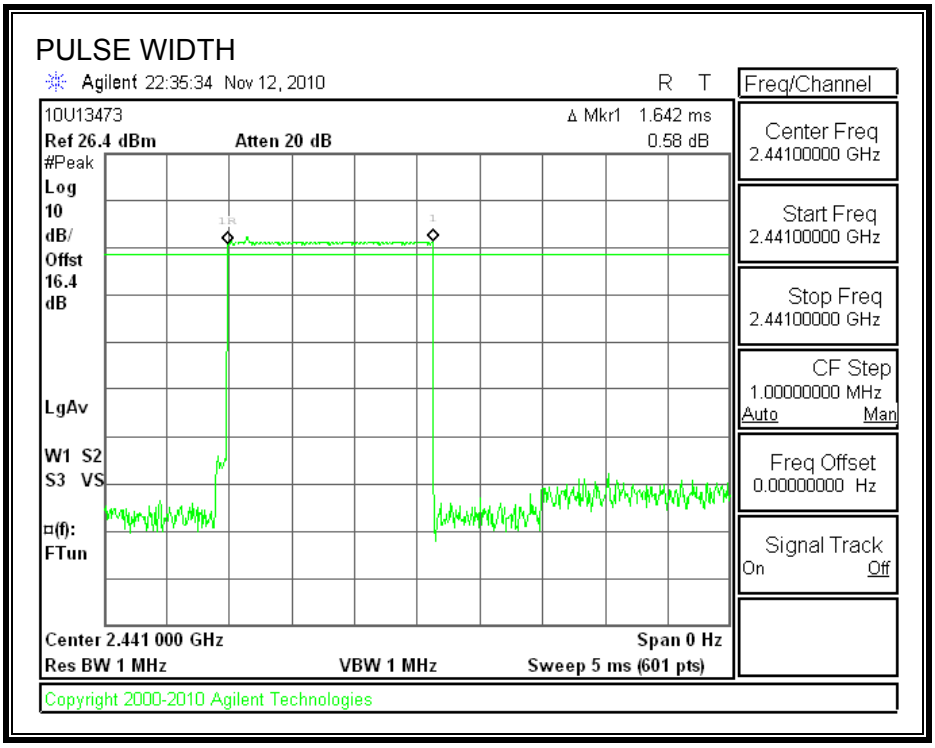
PULSE WIDTH 8PSK DH1



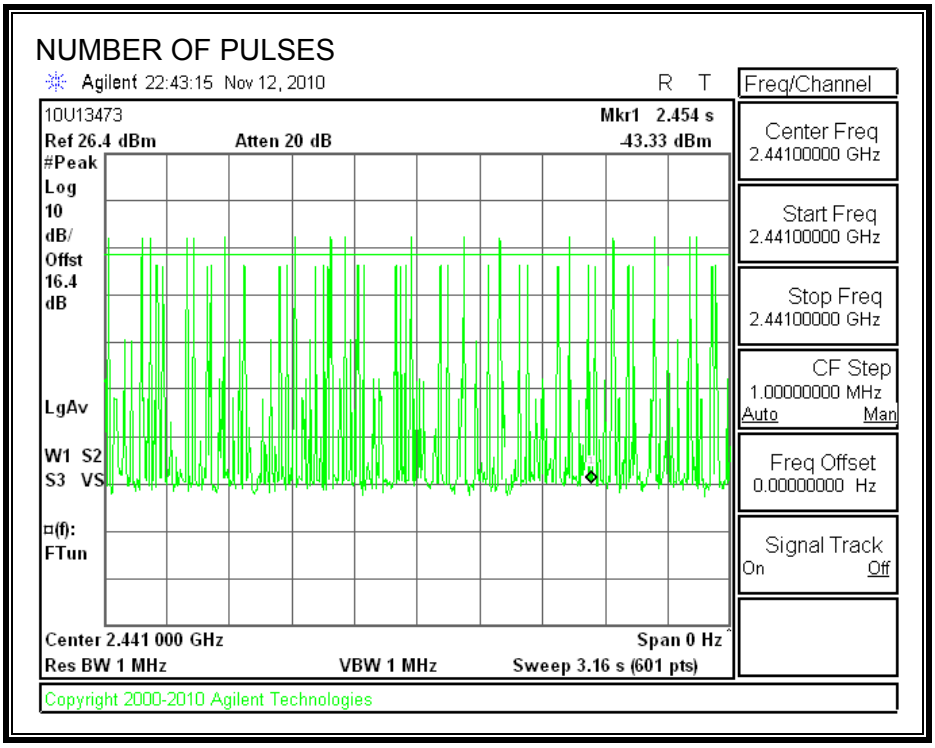
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



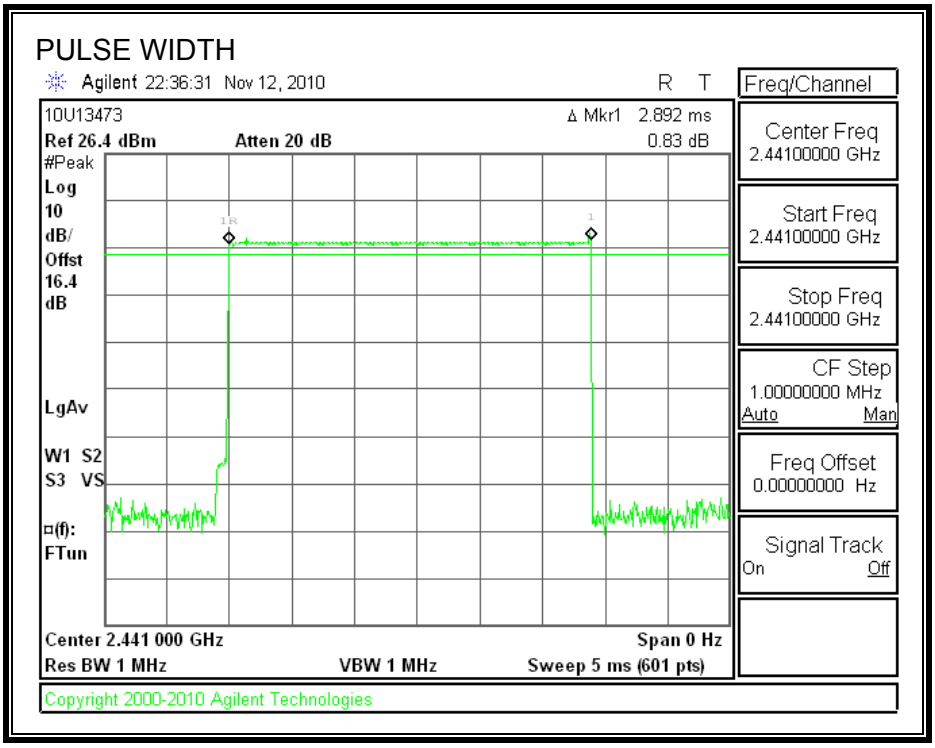
PULSE WIDTH 8PSK DH3



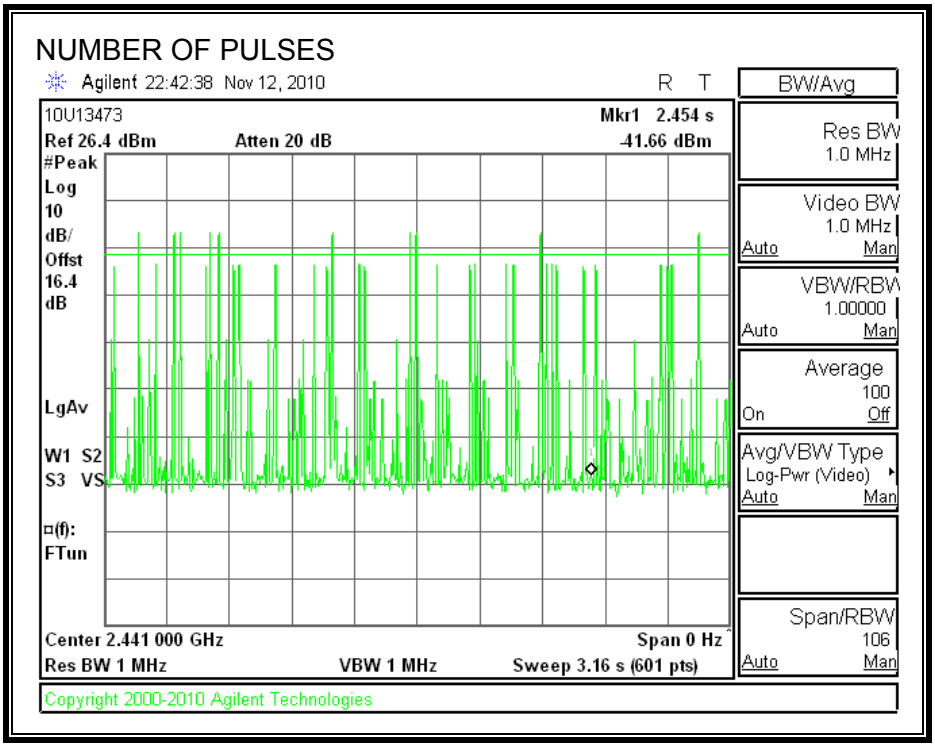
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



PULSE WIDTH 8PSK DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.3.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

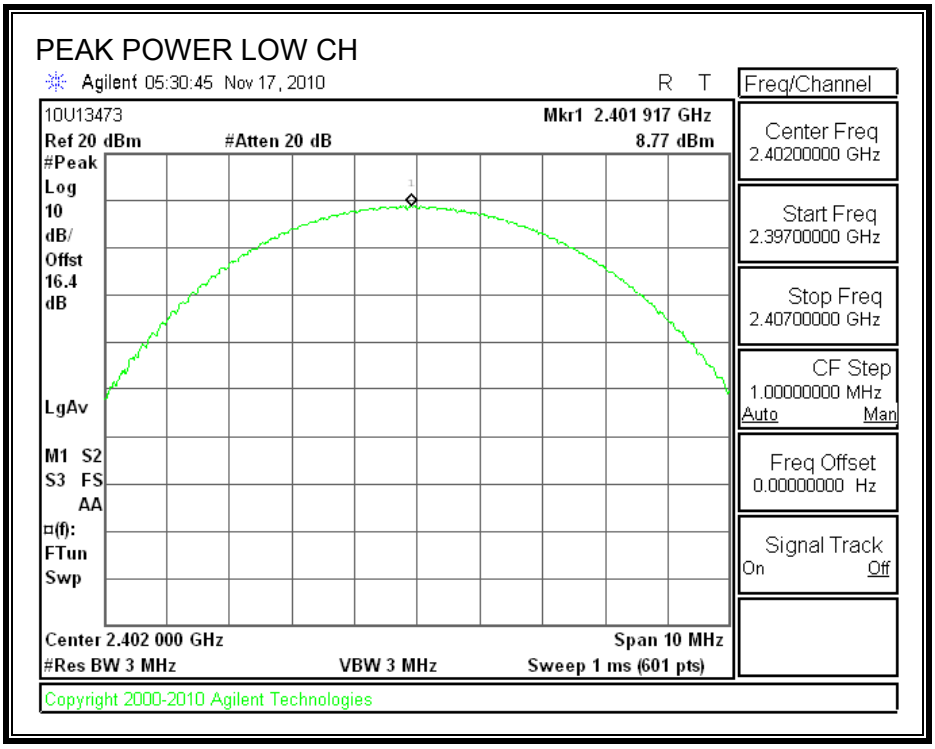
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

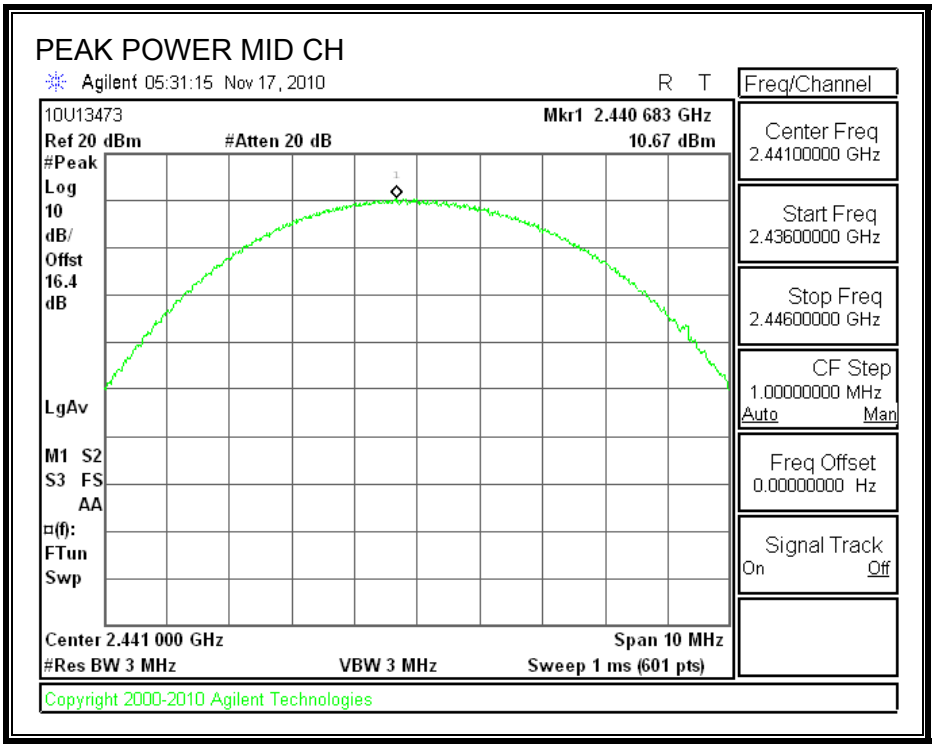
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.77	21	-12.23
Middle	2441	10.67	21	-10.33
High	2480	10.36	21	-10.64

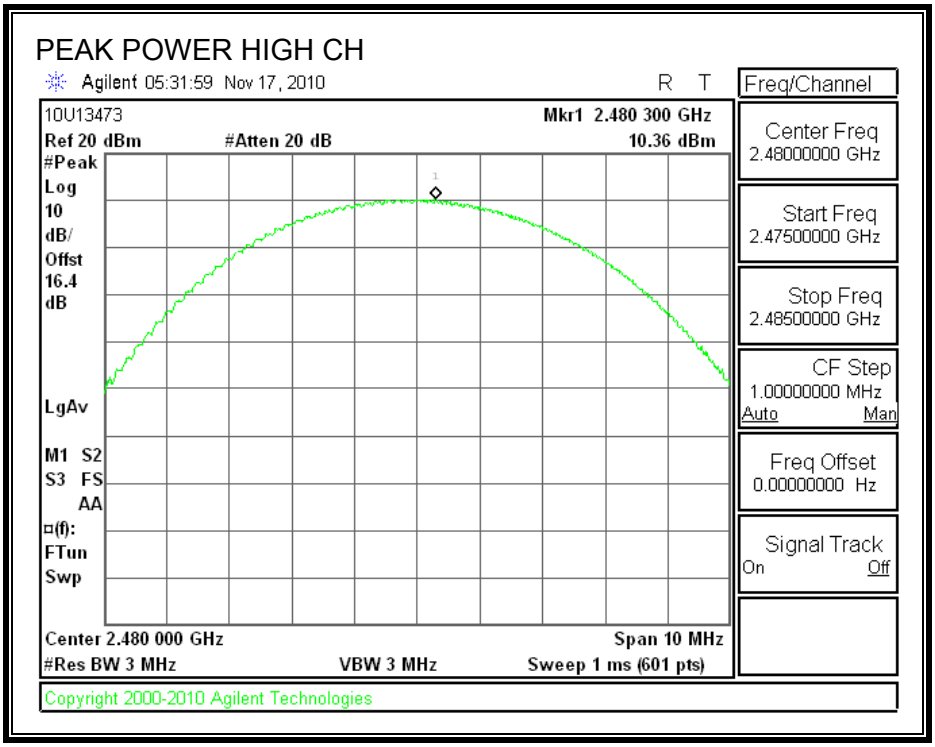
OUTPUT POWER

PEAK POWER LOW CH



PEAK POWER MID CH





7.3.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.4 dB (including 10 dB pad and 0.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.10
Middle	2441	6.90
High	2480	7.20

7.3.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

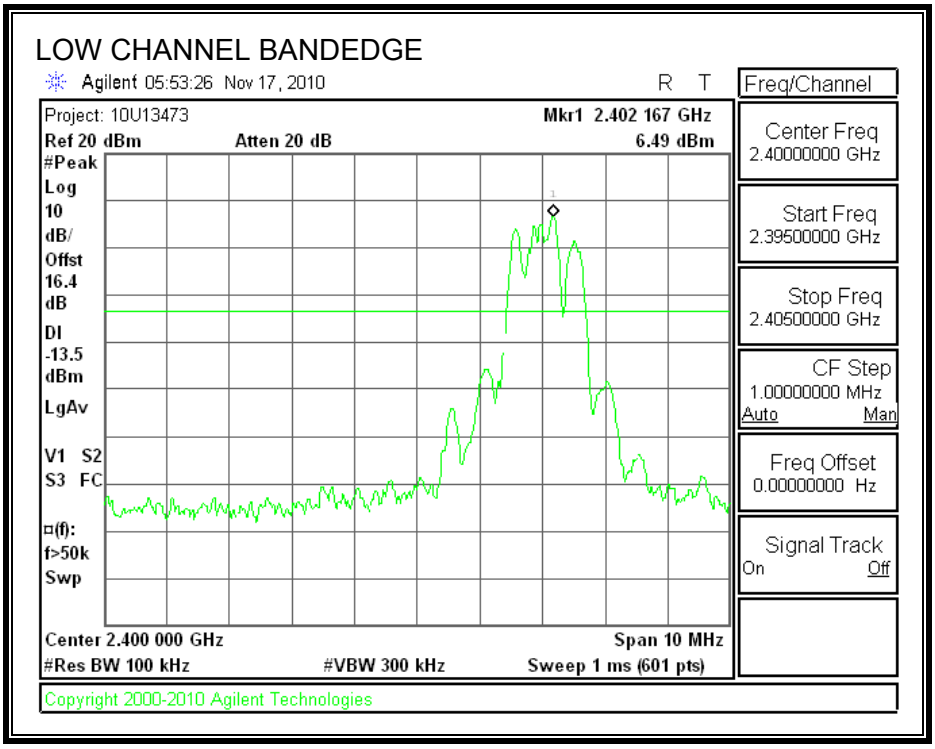
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

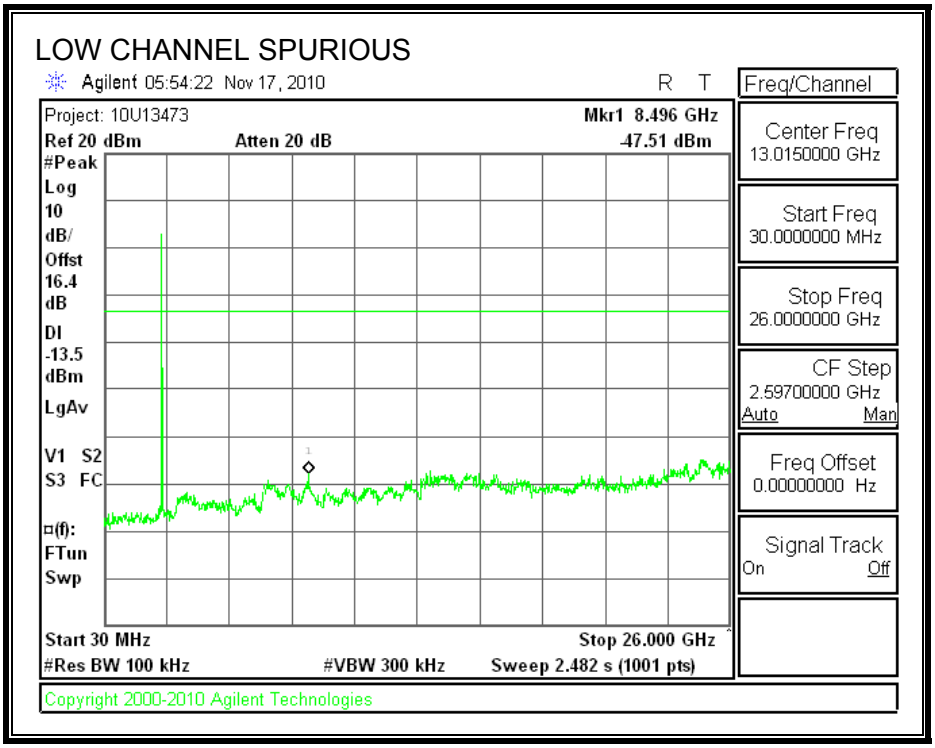
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

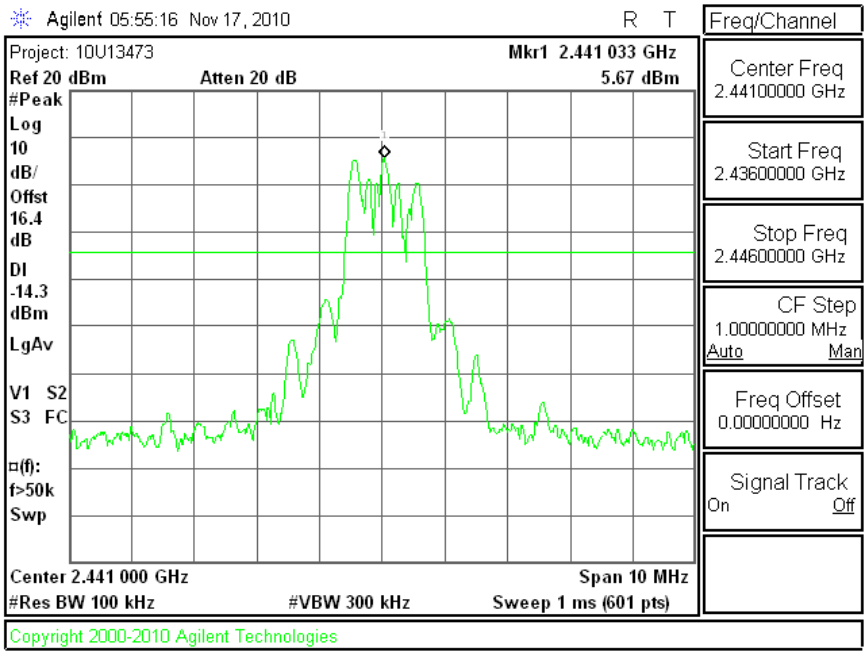
SPURIOUS EMISSIONS, LOW CHANNEL



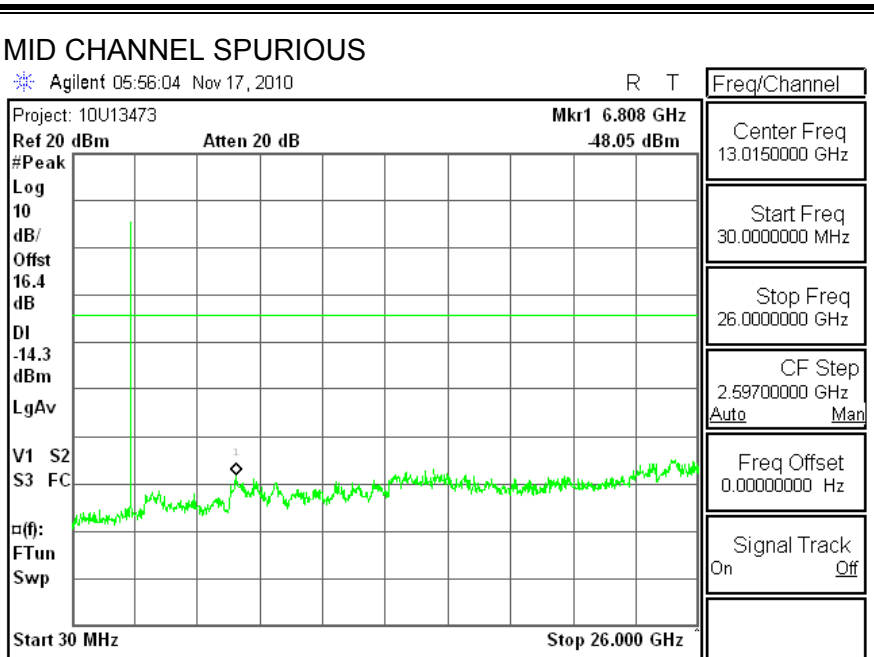


SPURIOUS EMISSIONS, MID CHANNEL

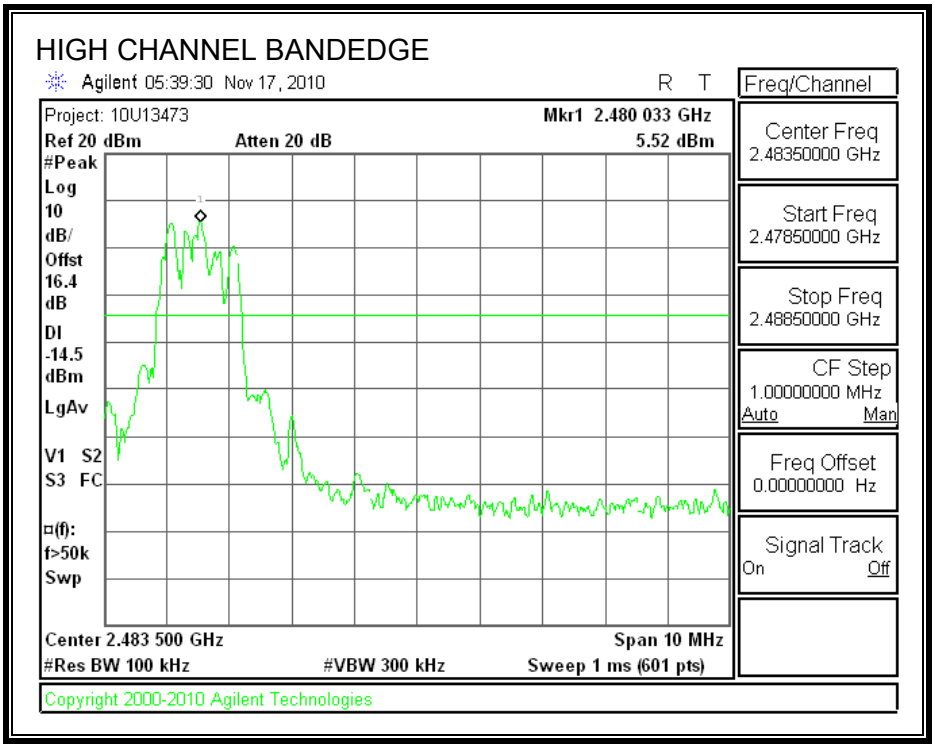
MID CHANNEL REFERENCE

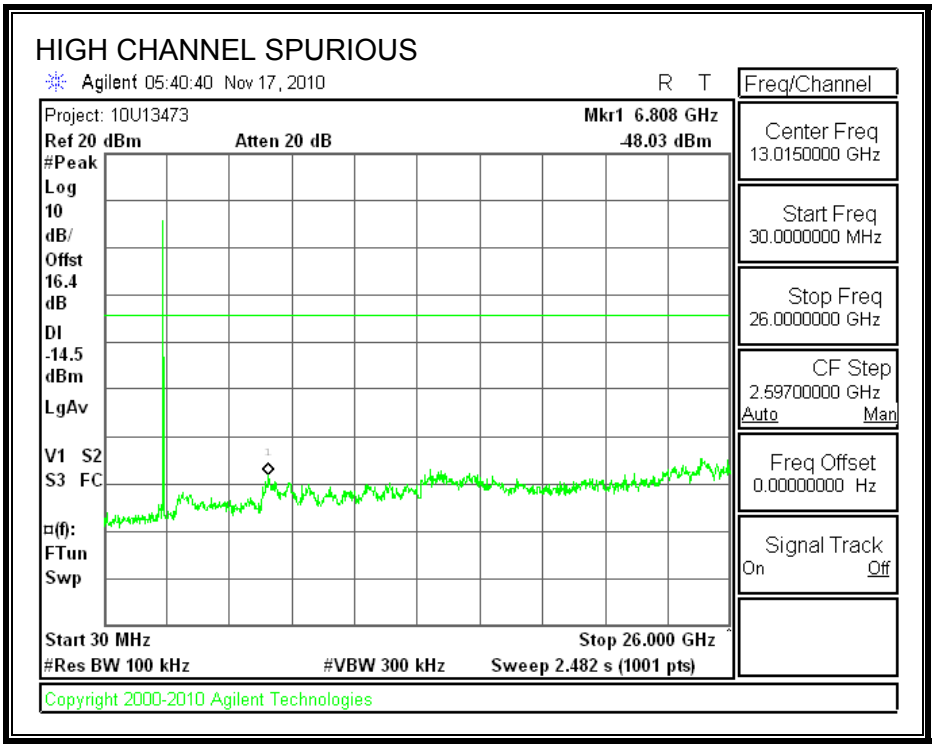


MID CHANNEL SPURIOUS



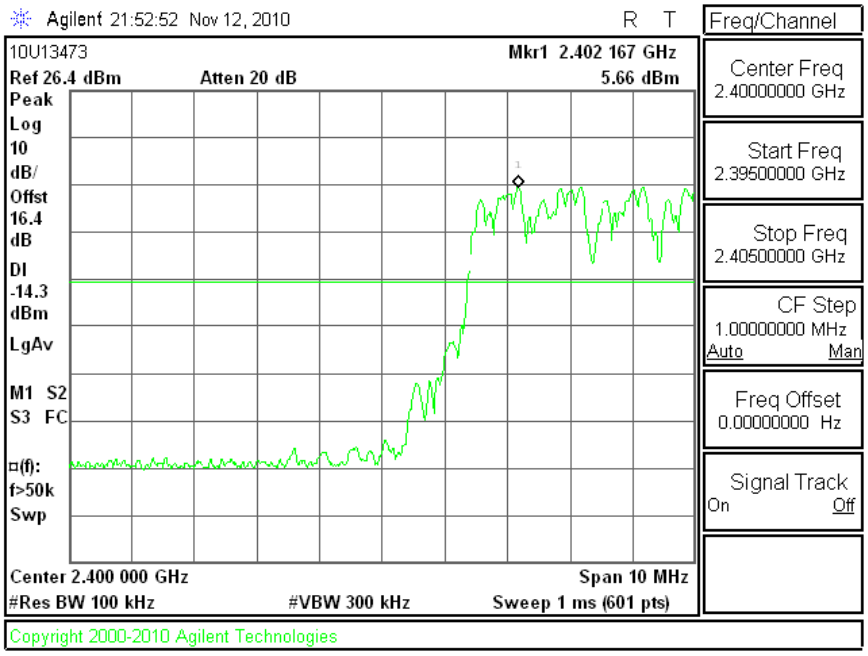
SPURIOUS EMISSIONS, HIGH CHANNEL



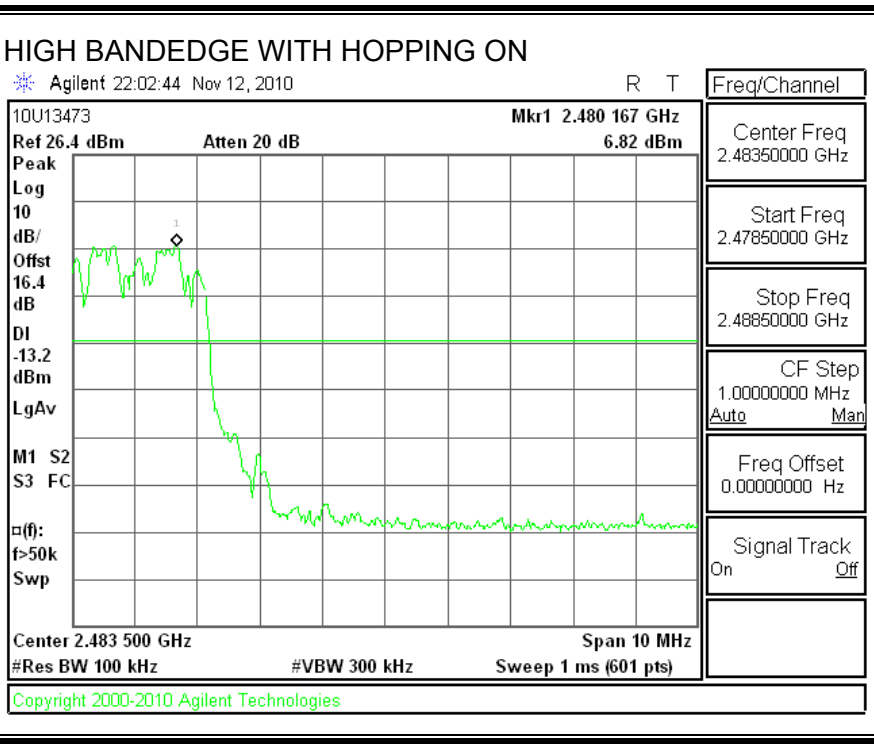


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

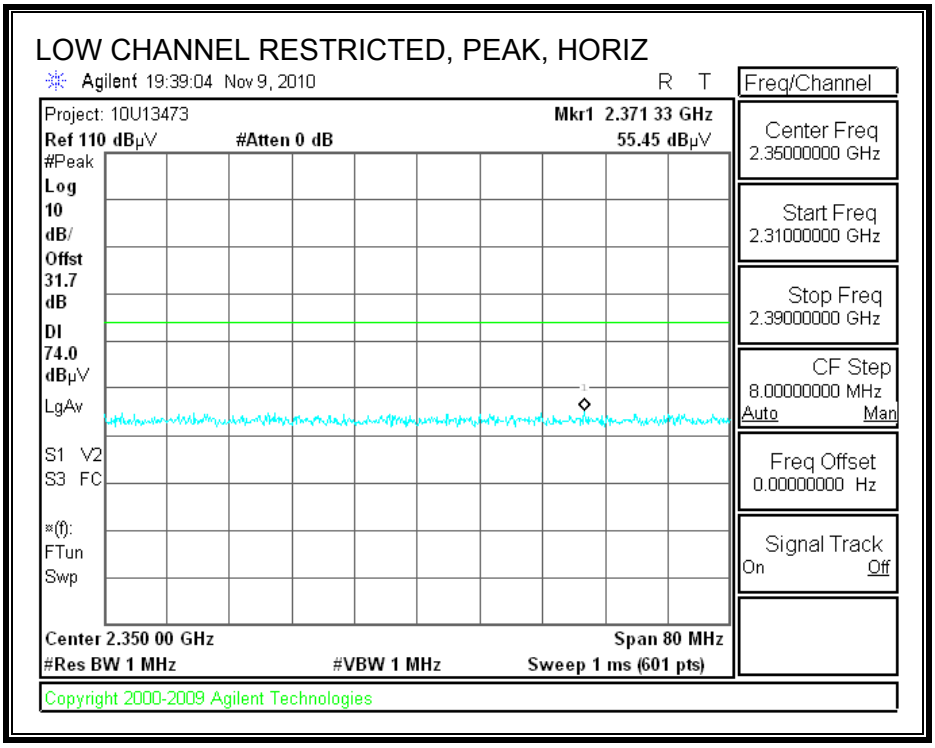
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

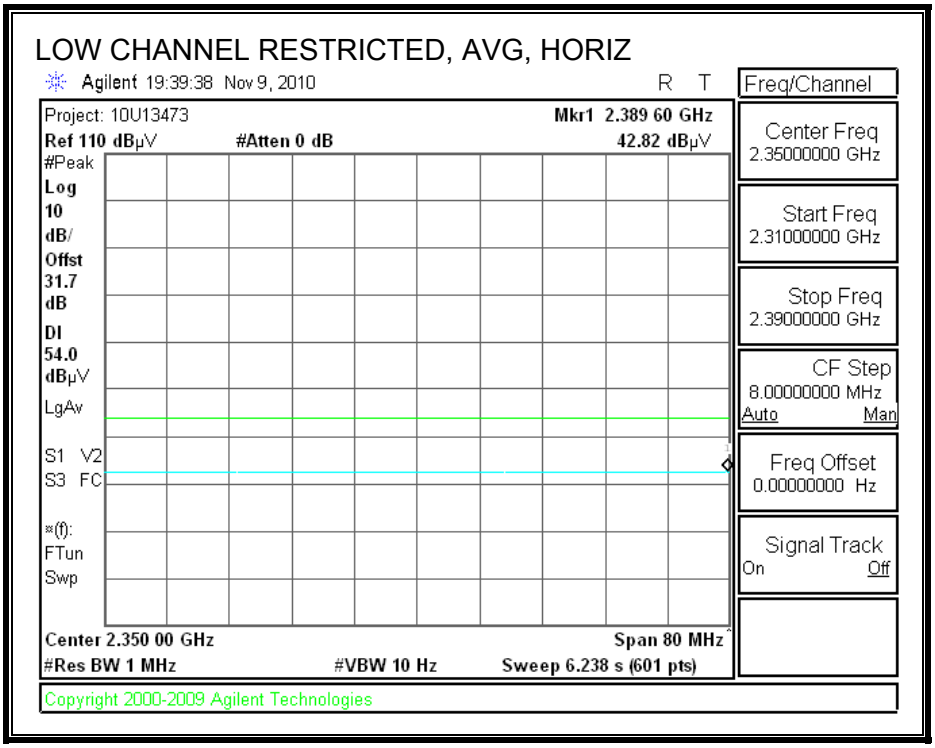
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

8.2. TRANSMITTER ABOVE 1 GHz

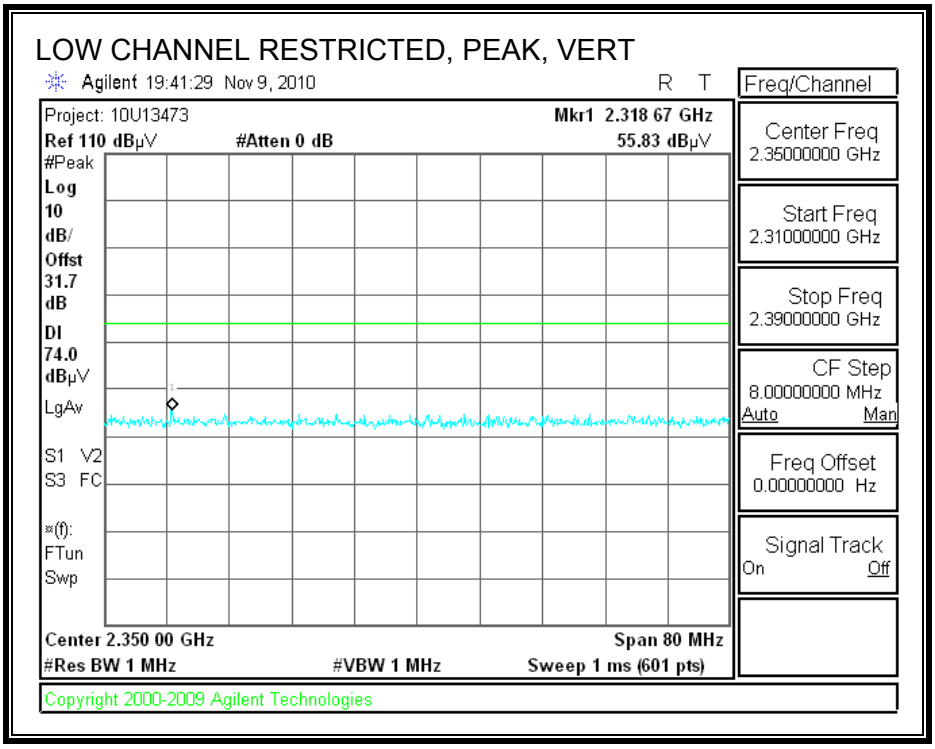
8.2.1. BASIC DATA RATE GFSK MODULATION

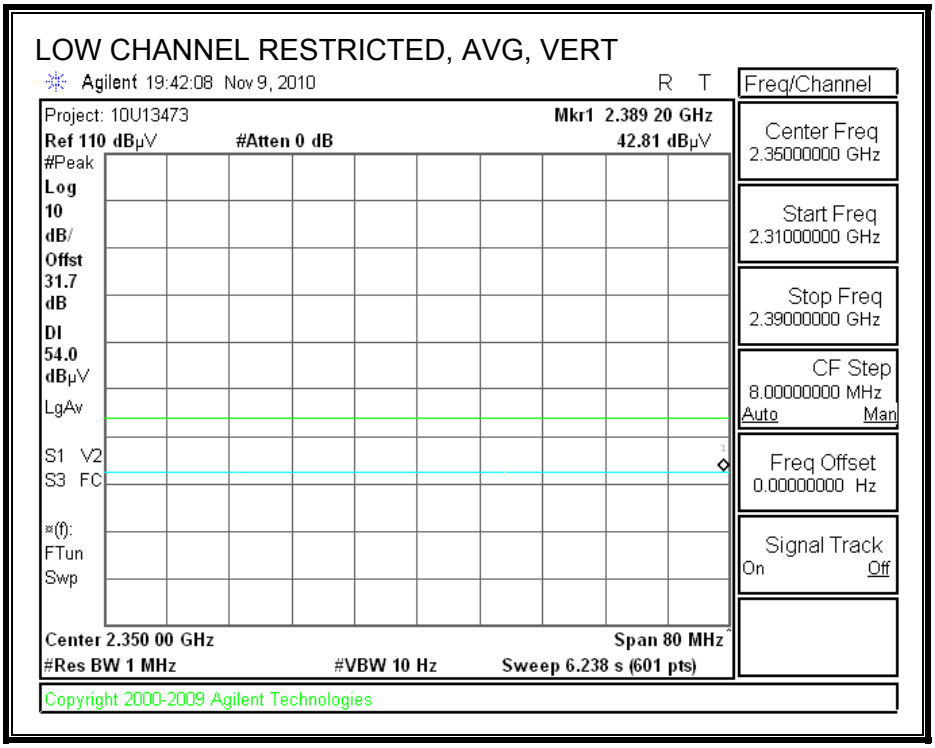
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



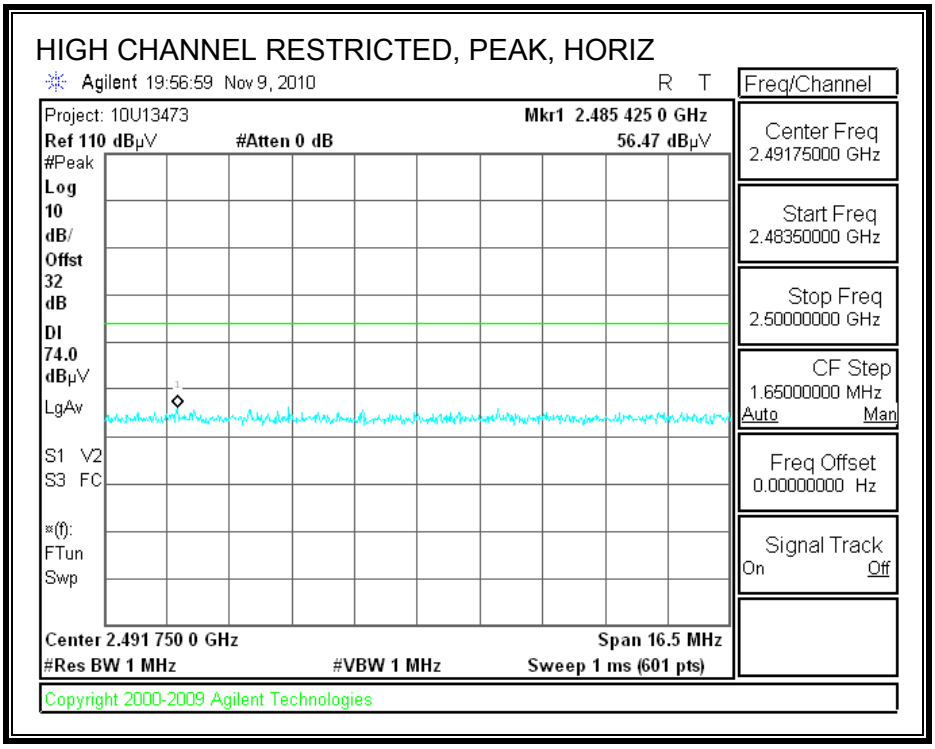


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

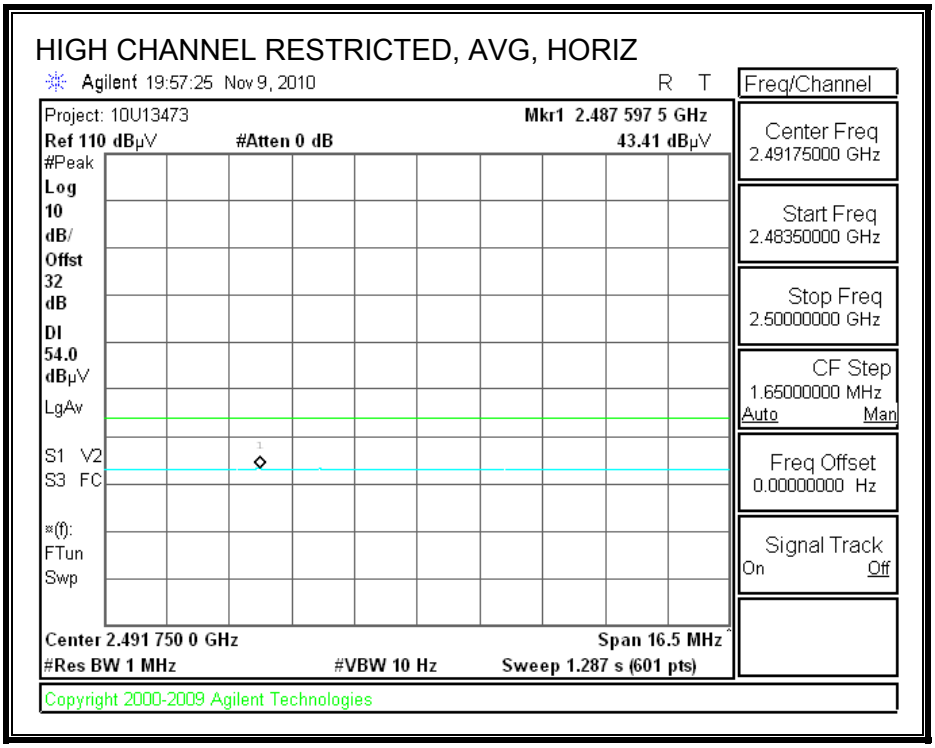




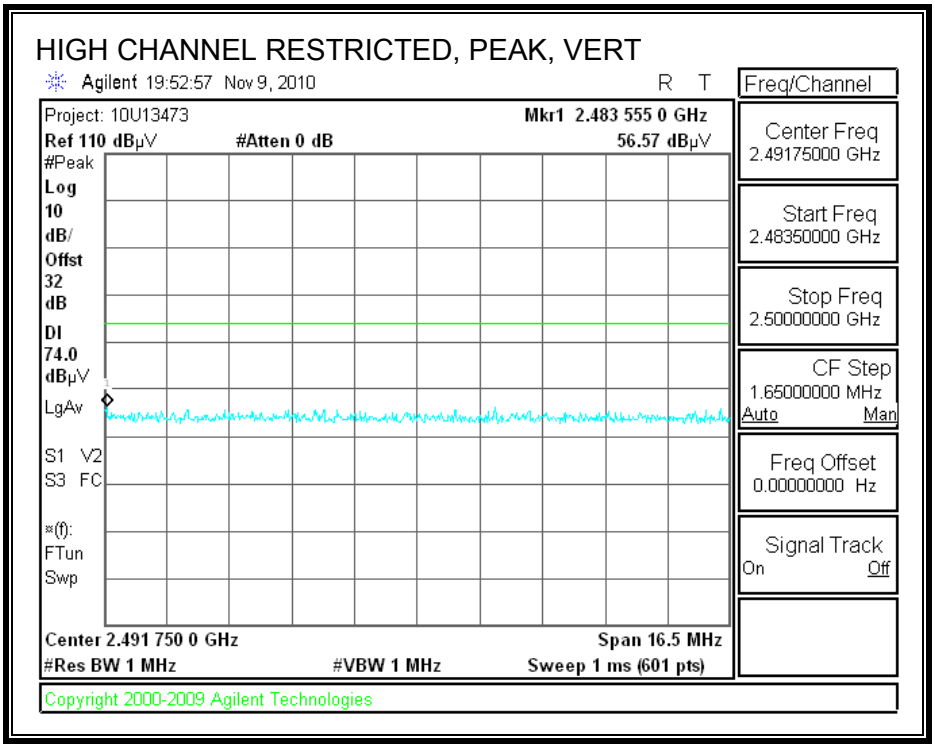
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



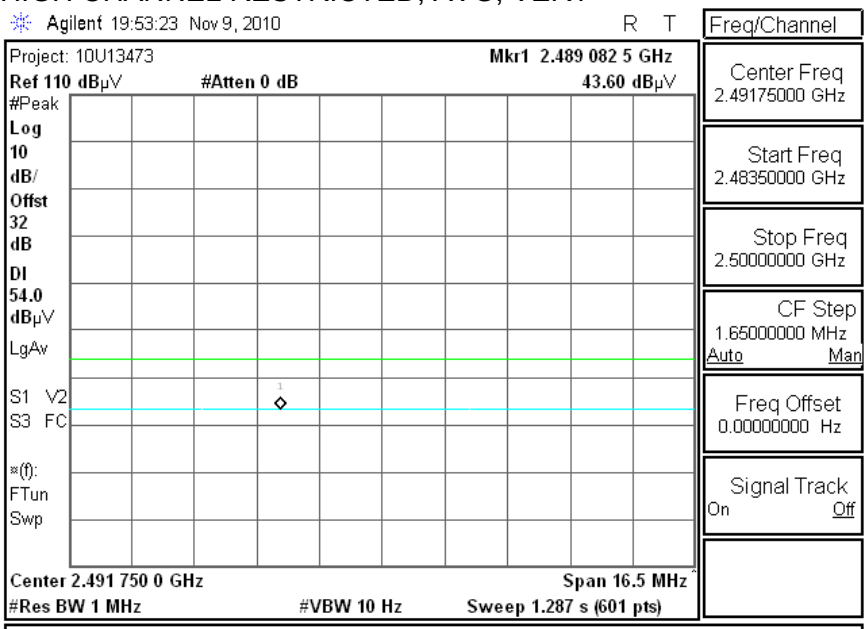
HIGH CHANNEL RESTRICTED, AVG, HORIZ



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HIGH CHANNEL RESTRICTED, AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom Chen
Date: 11/09/10
Project #: 10U13481
Test Target: FCC Class B
Mode Oper: TX mode, GFSK

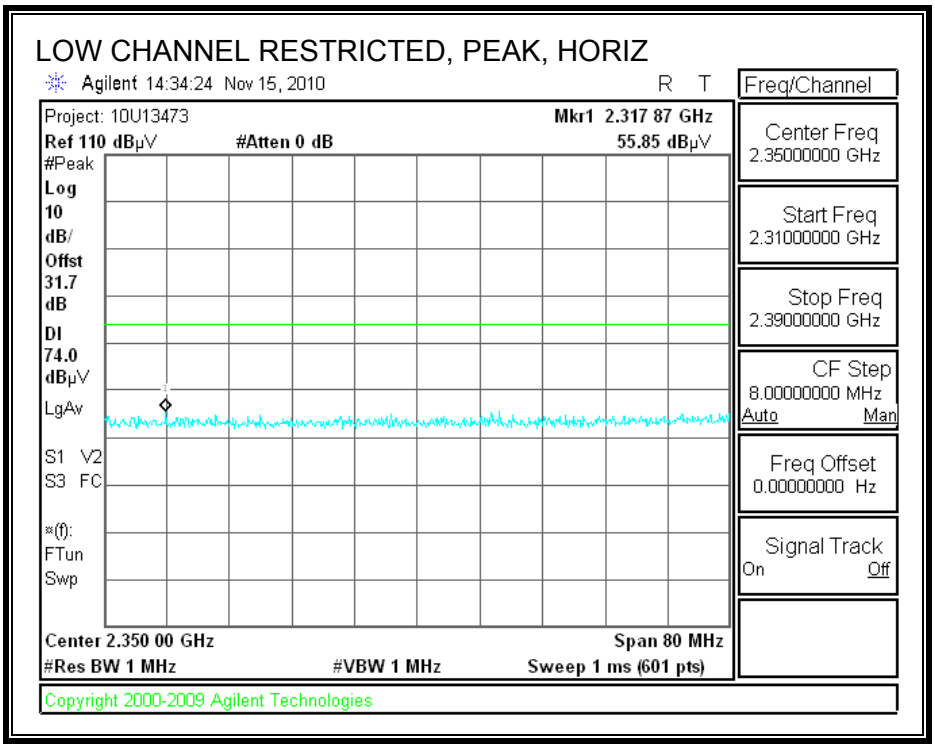
f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

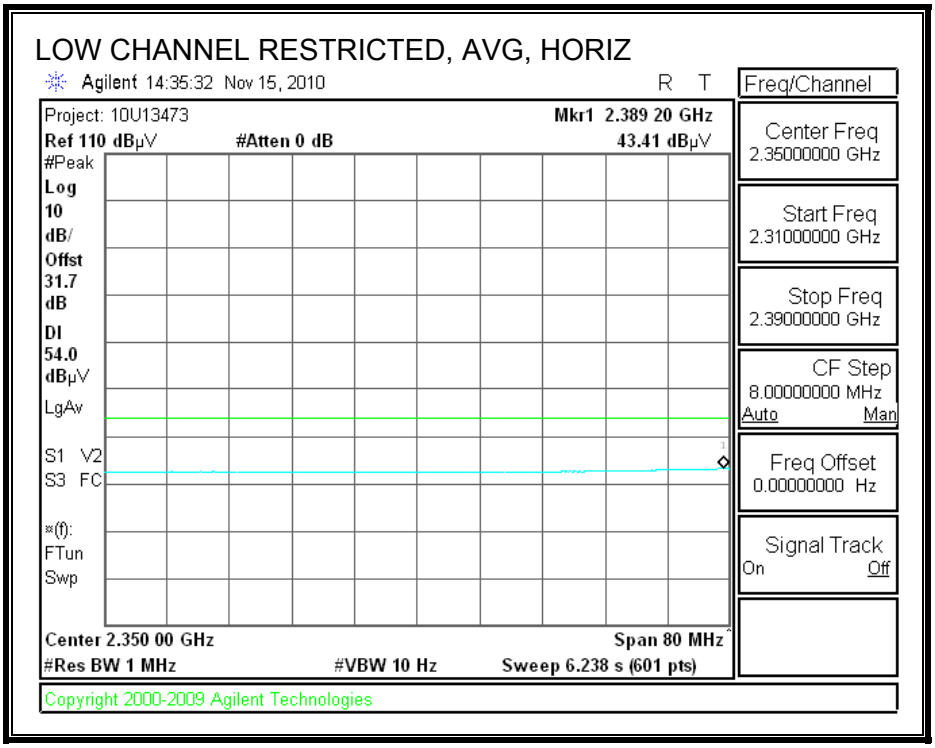
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
2402 MHz Low CH													
4.804	3.0	42.1	32.8	5.8	-34.8	0.0	0.0	45.8	74.0	-28.2	V	P	GFSK
4.804	3.0	33.3	32.8	5.8	-34.8	0.0	0.0	37.0	54.0	-17.0	V	A	GFSK
7.206	3.0	37.8	35.0	7.2	-34.7	0.0	0.0	45.4	74.0	-28.6	V	P	GFSK
7.206	3.0	24.8	35.0	7.2	-34.7	0.0	0.0	32.4	54.0	-21.6	V	A	GFSK
2402 MHz Low CH													
4.804	3.0	39.7	32.8	5.8	-34.8	0.0	0.0	43.4	74.0	-30.6	H	P	GFSK
4.804	3.0	28.8	32.8	5.8	-34.8	0.0	0.0	32.5	54.0	-21.5	H	A	GFSK
7.206	3.0	36.9	35.0	7.2	-34.7	0.0	0.0	44.5	74.0	-29.5	H	P	GFSK
7.206	3.0	24.7	35.0	7.2	-34.7	0.0	0.0	32.3	54.0	-21.7	H	A	GFSK
2441 MHz Mid CH													
4.882	3.0	39.1	32.8	5.8	-34.9	0.0	0.0	42.9	74.0	-31.1	H	P	GFSK
4.882	3.0	28.3	32.8	5.8	-34.9	0.0	0.0	32.1	54.0	-21.9	H	A	GFSK
7.323	3.0	37.5	35.2	7.3	-34.7	0.0	0.0	45.3	74.0	-28.7	H	P	GFSK
7.323	3.0	24.8	35.2	7.3	-34.7	0.0	0.0	32.6	54.0	-21.4	H	A	GFSK
2441 MHz Mid CH													
4.882	3.0	39.5	32.8	5.8	-34.9	0.0	0.0	43.3	74.0	-30.7	V	P	GFSK
4.882	3.0	30.0	32.8	5.8	-34.9	0.0	0.0	33.8	54.0	-20.2	V	A	GFSK
7.323	3.0	37.5	35.2	7.3	-34.7	0.0	0.0	45.4	74.0	-28.6	V	P	GFSK
7.323	3.0	24.8	35.2	7.3	-34.7	0.0	0.0	32.6	54.0	-21.4	V	A	GFSK
2480 MHz High CH													
4.960	3.0	38.7	32.9	5.9	-34.9	0.0	0.0	42.6	74.0	-31.4	V	P	GFSK
4.960	3.0	28.5	32.9	5.9	-34.9	0.0	0.0	32.5	54.0	-21.5	V	A	GFSK
7.440	3.0	36.8	35.4	7.3	-34.6	0.0	0.0	44.9	74.0	-29.1	V	P	GFSK
7.440	3.0	24.5	35.4	7.3	-34.6	0.0	0.0	32.6	54.0	-21.4	V	A	GFSK
2480 MHz High CH													
4.960	3.0	38.5	32.9	5.9	-34.9	0.0	0.0	42.4	74.0	-31.6	H	P	GFSK
4.960	3.0	27.6	32.9	5.9	-34.9	0.0	0.0	31.5	54.0	-22.5	H	A	GFSK
7.440	3.0	36.9	35.4	7.3	-34.6	0.0	0.0	44.9	74.0	-29.1	H	P	GFSK
7.440	3.0	24.4	35.4	7.3	-34.6	0.0	0.0	32.5	54.0	-21.5	H	A	GFSK

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

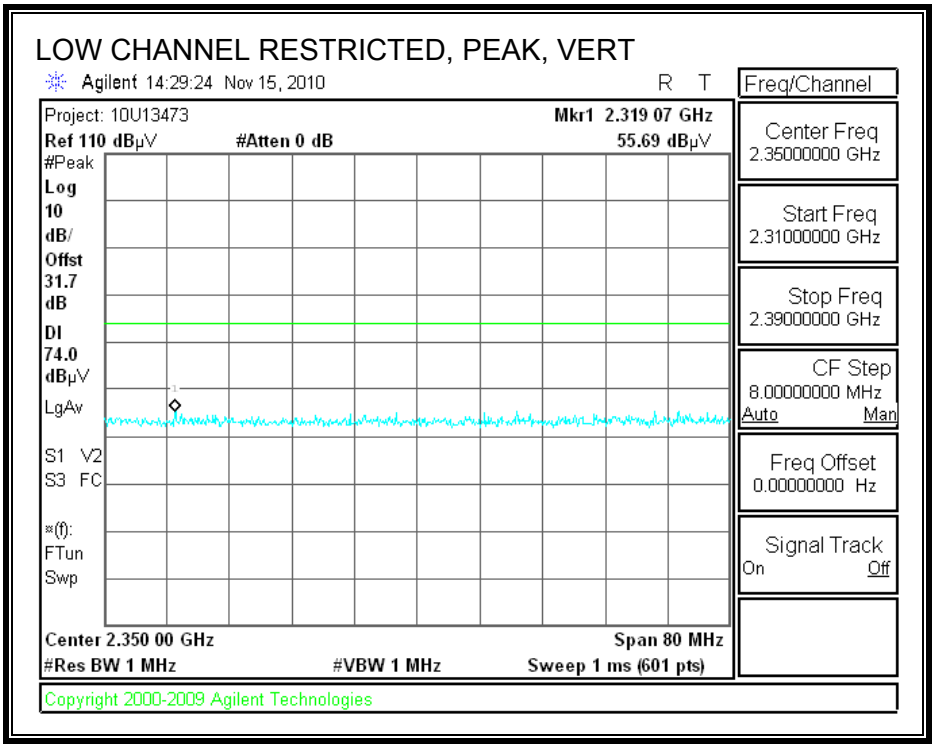
8.2.2. ENHANCED DATA RATE QPSK MODULATION

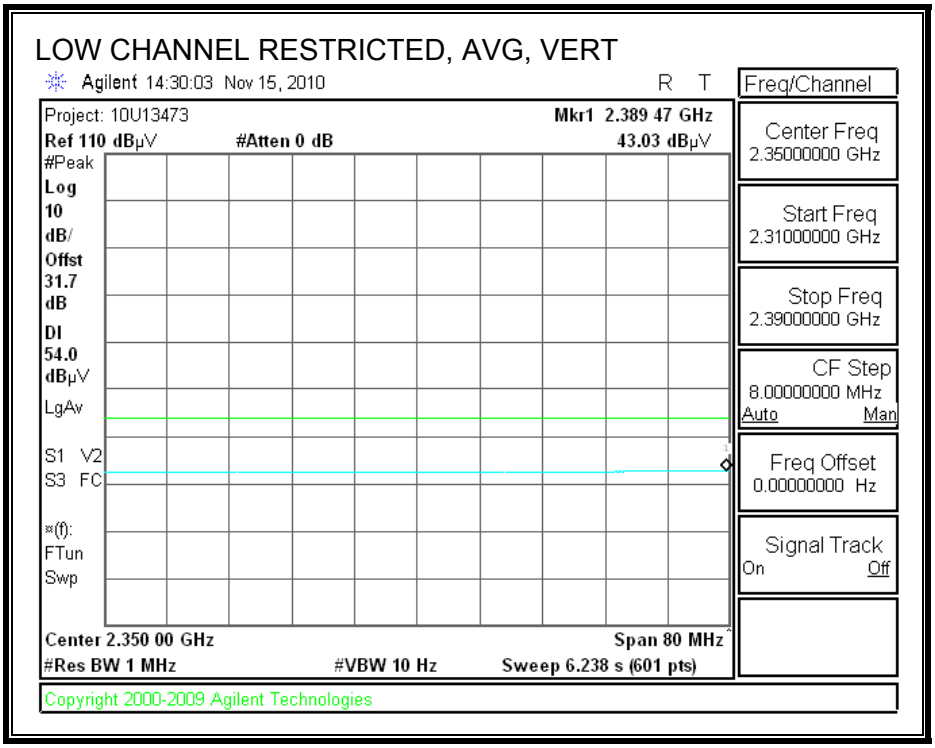
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



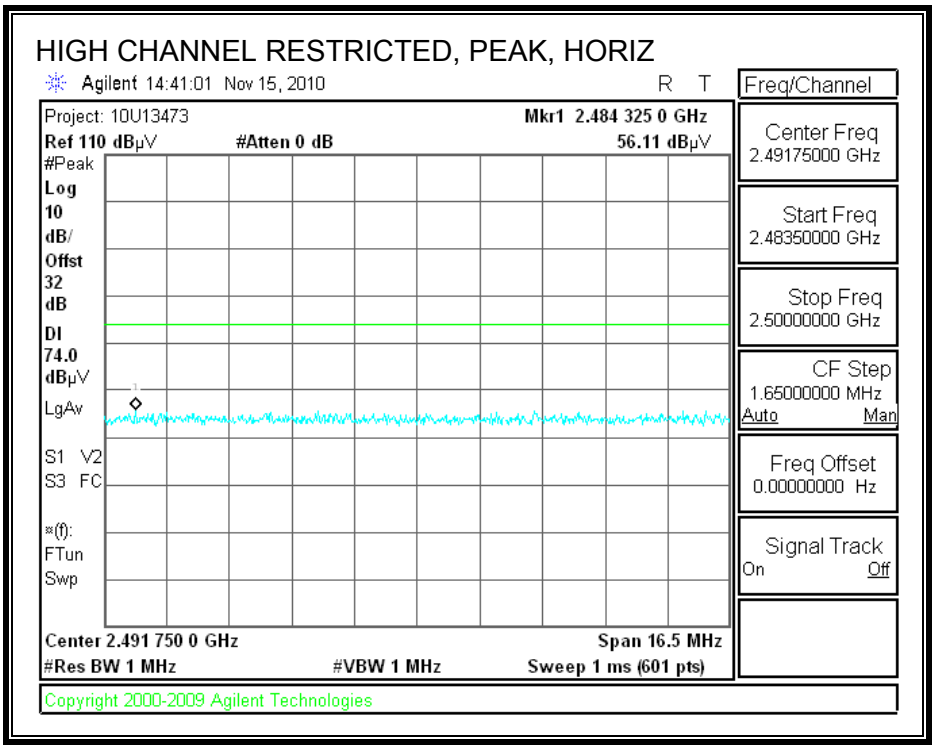


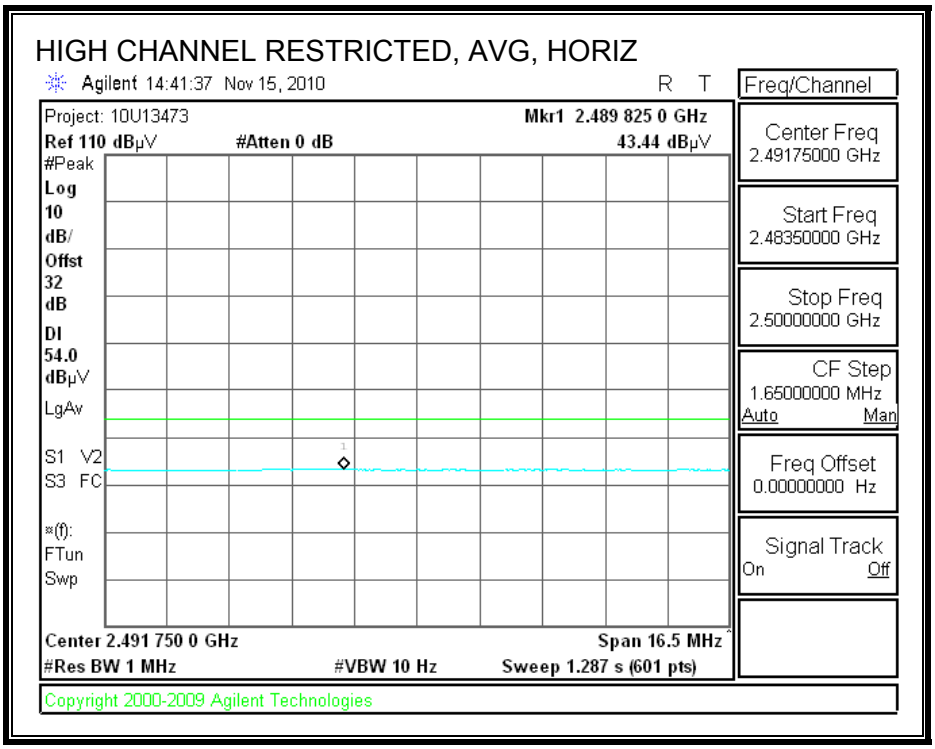
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



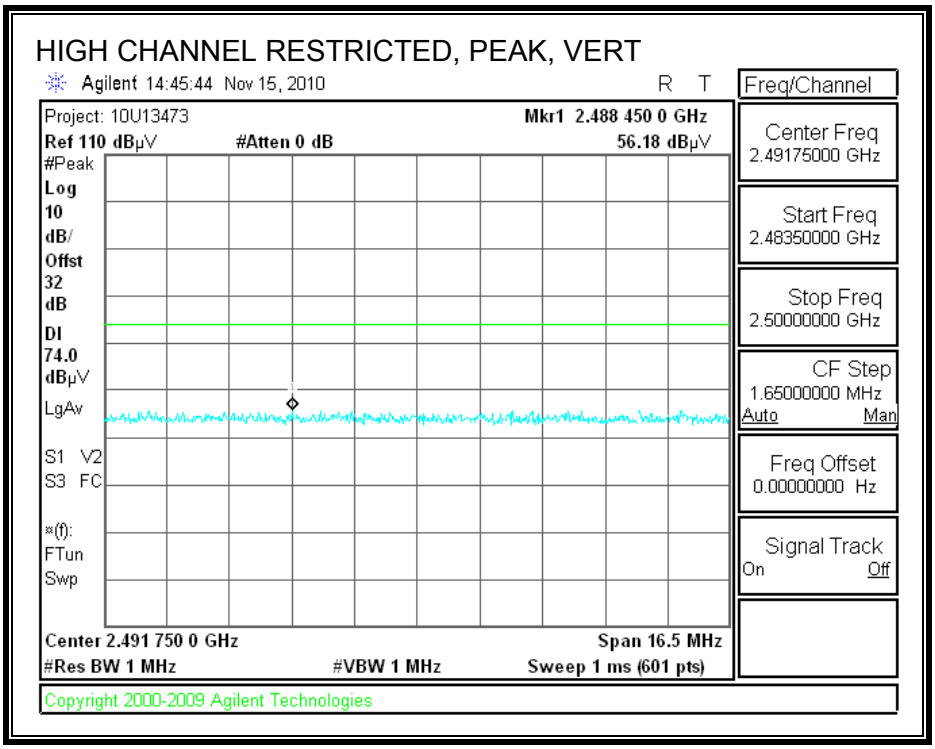


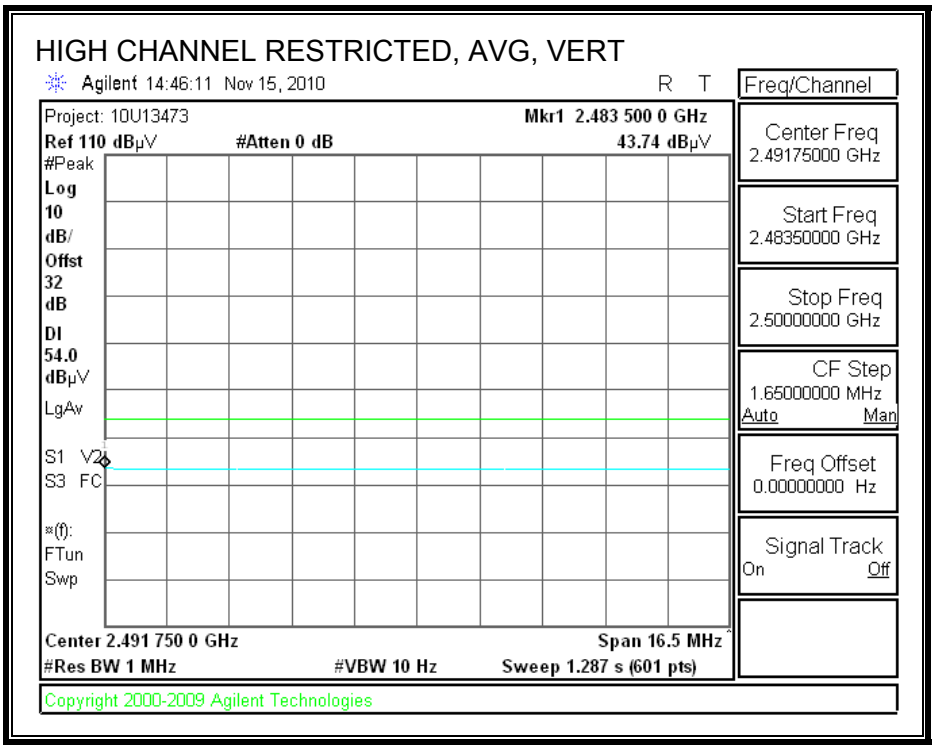
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom Chen
Date: 11/15/10
Project #: 10U13481
Company: Apple
Test Target: FCC Class B
Mode Oper: TX mode, DQPSK

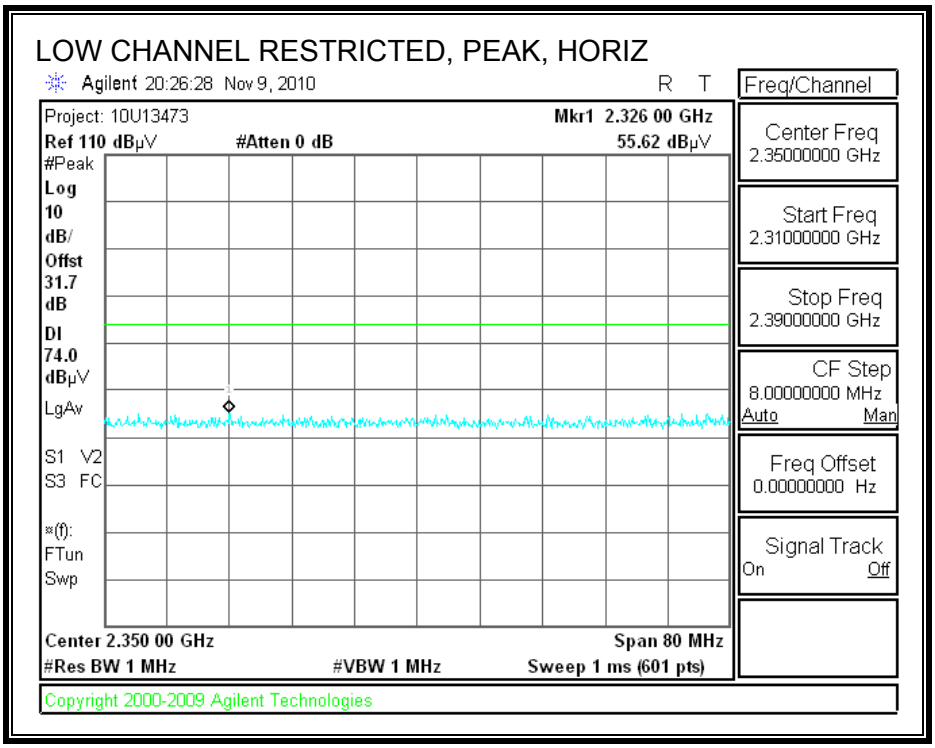
f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

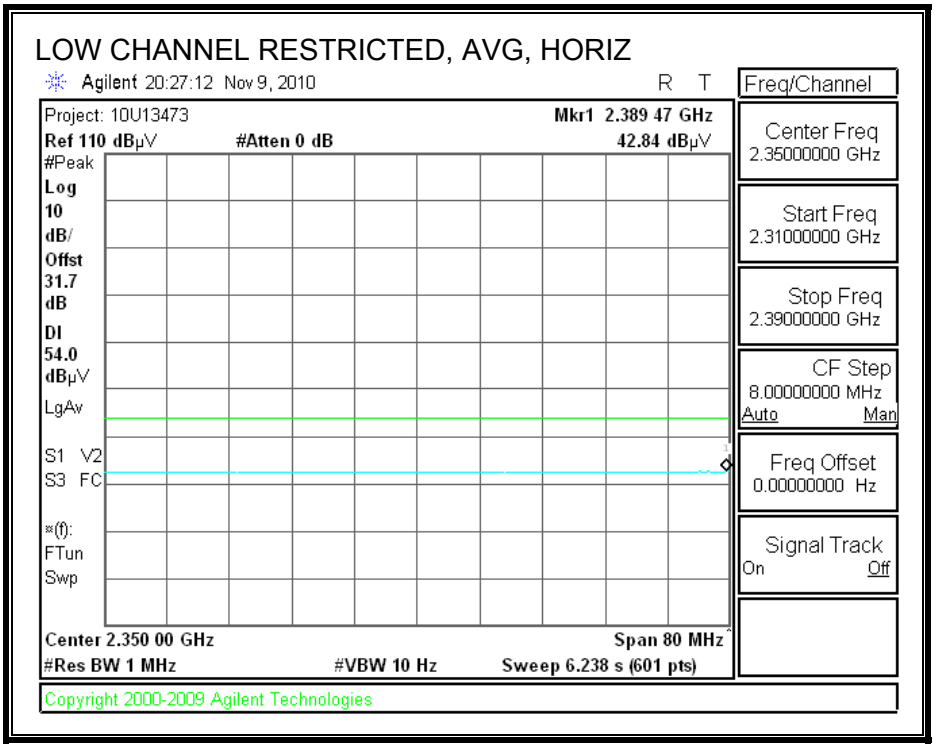
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
2402 MHz Low CH													
4.804	3.0	39.7	32.8	5.8	-34.8	0.0	0.0	43.4	74.0	-30.6	H	P	DQPSK
4.804	3.0	30.4	32.8	5.8	-34.8	0.0	0.0	34.1	54.0	-19.9	H	A	DQPSK
7.206	3.0	36.9	35.0	7.2	-34.7	0.0	0.0	44.5	74.0	-29.5	H	P	DQPSK
7.206	3.0	24.9	35.0	7.2	-34.7	0.0	0.0	32.5	54.0	-21.5	H	A	DQPSK
2402 MHz Low CH													
4.804	3.0	40.3	32.8	5.8	-34.8	0.0	0.0	44.0	74.0	-30.0	V	P	DQPSK
4.804	3.0	31.5	32.8	5.8	-34.8	0.0	0.0	35.2	54.0	-18.8	V	A	DQPSK
7.206	3.0	37.8	35.0	7.2	-34.7	0.0	0.0	45.4	74.0	-28.6	V	P	DQPSK
7.206	3.0	24.9	35.0	7.2	-34.7	0.0	0.0	32.5	54.0	-21.5	V	A	DQPSK
2441 MHz Mid CH													
4.882	3.0	38.7	32.8	5.8	-34.9	0.0	0.0	42.5	74.0	-31.5	V	P	DQPSK
4.882	3.0	28.4	32.8	5.8	-34.9	0.0	0.0	32.2	54.0	-21.8	V	A	DQPSK
7.323	3.0	36.6	35.2	7.3	-34.7	0.0	0.0	44.4	74.0	-29.6	V	P	DQPSK
7.323	3.0	24.8	35.2	7.3	-34.7	0.0	0.0	32.7	54.0	-21.3	V	A	DQPSK
2441 MHz Mid CH													
4.882	3.0	37.4	32.8	5.8	-34.9	0.0	0.0	41.2	74.0	-32.8	H	P	DQPSK
4.882	3.0	25.6	32.8	5.8	-34.9	0.0	0.0	29.4	54.0	-24.6	H	A	DQPSK
7.323	3.0	38.0	35.2	7.3	-34.7	0.0	0.0	45.8	74.0	-28.2	H	P	DQPSK
7.323	3.0	24.9	35.2	7.3	-34.7	0.0	0.0	32.7	54.0	-21.3	H	A	DQPSK
2480 MHz High CH													
4.960	3.0	38.1	32.9	5.9	-34.9	0.0	0.0	42.0	74.0	-32.0	V	P	DQPSK
4.960	3.0	28.1	32.9	5.9	-34.9	0.0	0.0	32.0	54.0	-22.0	V	A	DQPSK
7.440	3.0	36.8	35.4	7.3	-34.6	0.0	0.0	44.9	74.0	-29.1	V	P	DQPSK
7.440	3.0	24.6	35.4	7.3	-34.6	0.0	0.0	32.7	54.0	-21.3	V	A	DQPSK
2480 MHz High CH													
4.960	3.0	38.2	32.9	5.9	-34.9	0.0	0.0	42.1	74.0	-31.9	H	P	DQPSK
4.960	3.0	27.4	32.9	5.9	-34.9	0.0	0.0	31.3	54.0	-22.7	H	A	DQPSK
7.440	3.0	36.9	35.4	7.3	-34.6	0.0	0.0	45.0	74.0	-29.0	H	P	DQPSK
7.440	3.0	24.6	35.4	7.3	-34.6	0.0	0.0	32.6	54.0	-21.4	H	A	DQPSK

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

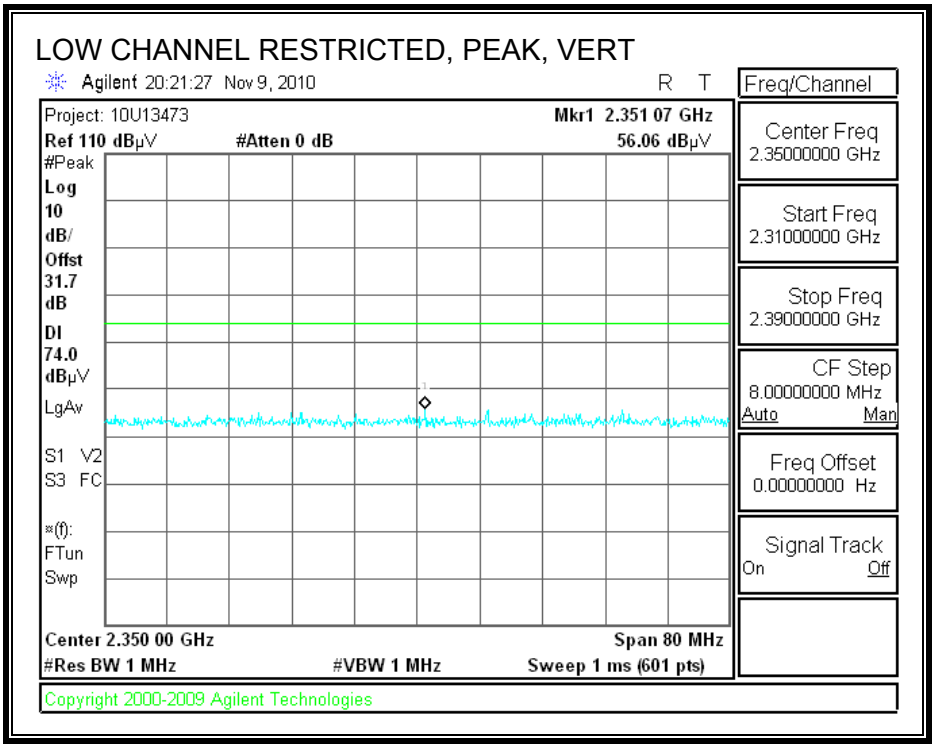
8.2.3. ENHANCED DATA RATE 8PSK MODULATION

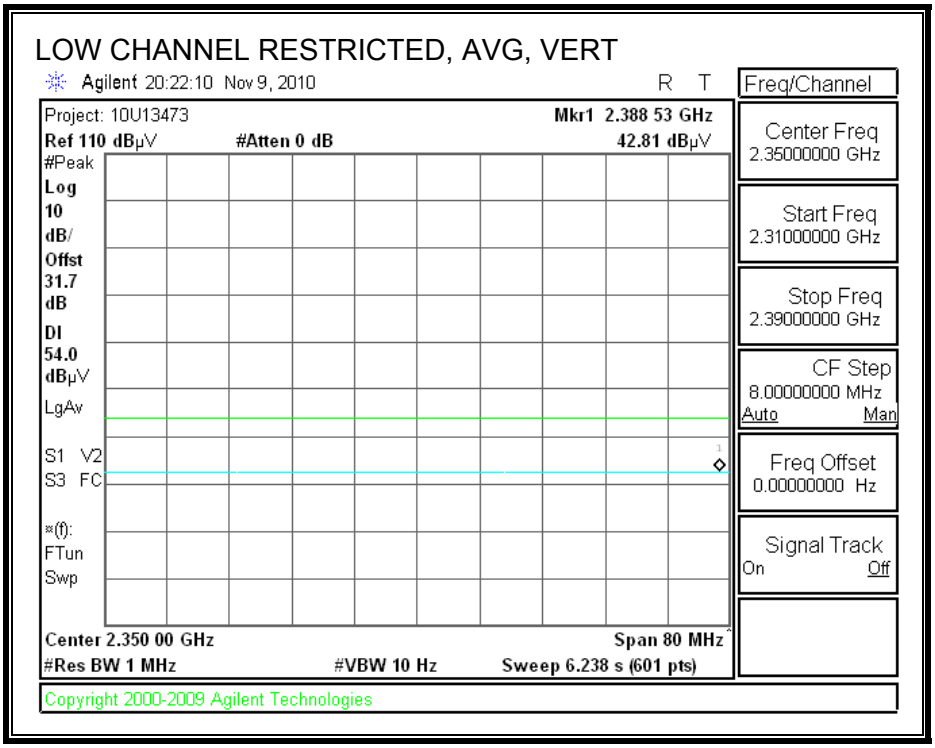
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



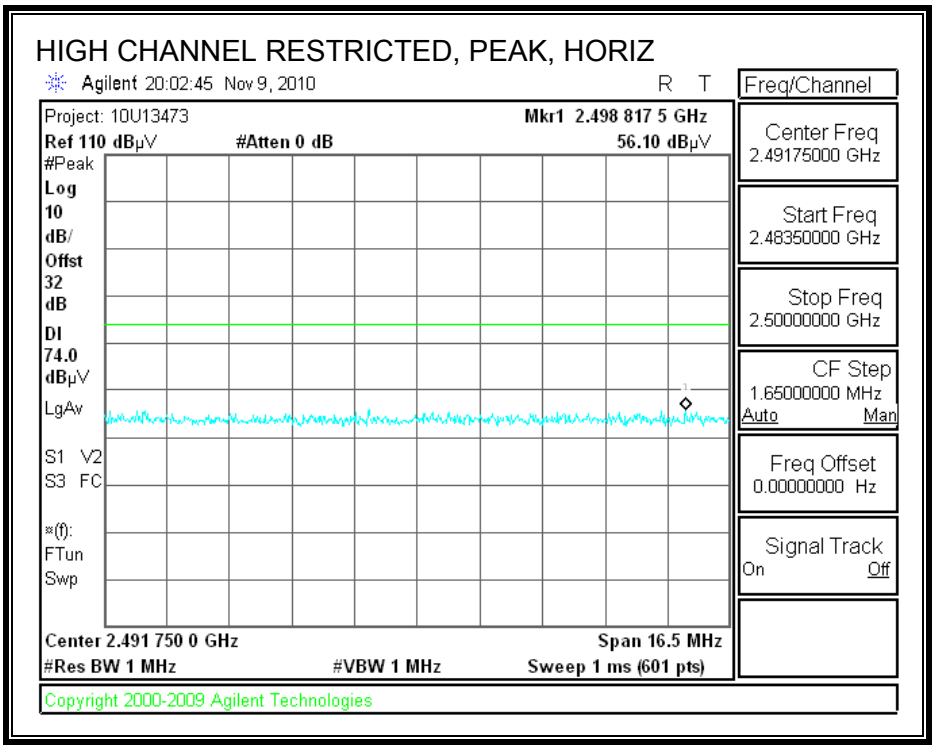


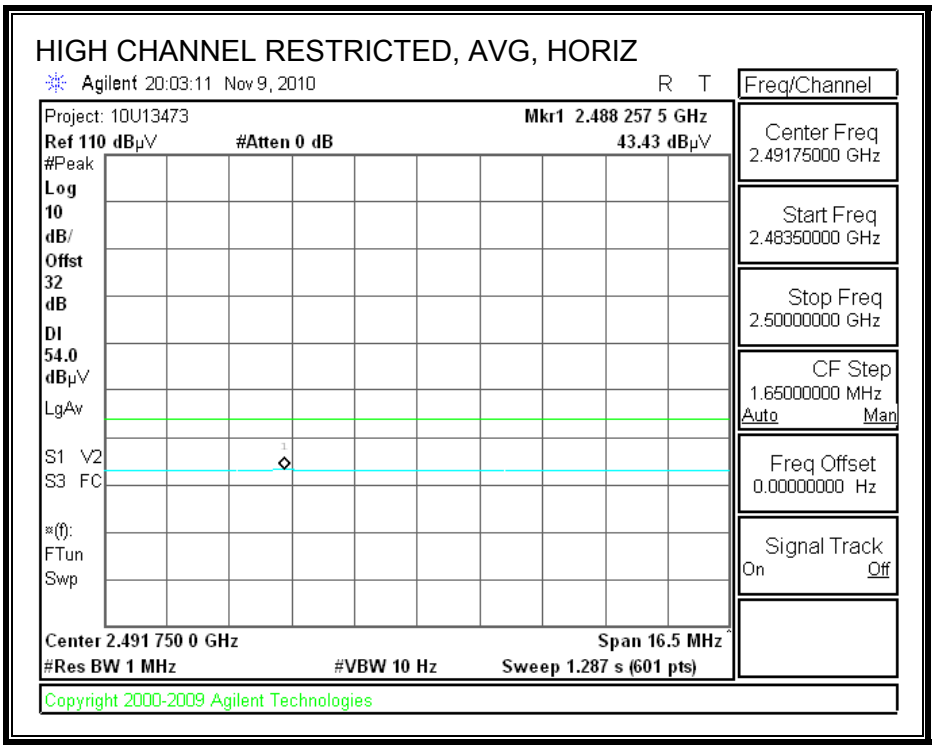
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



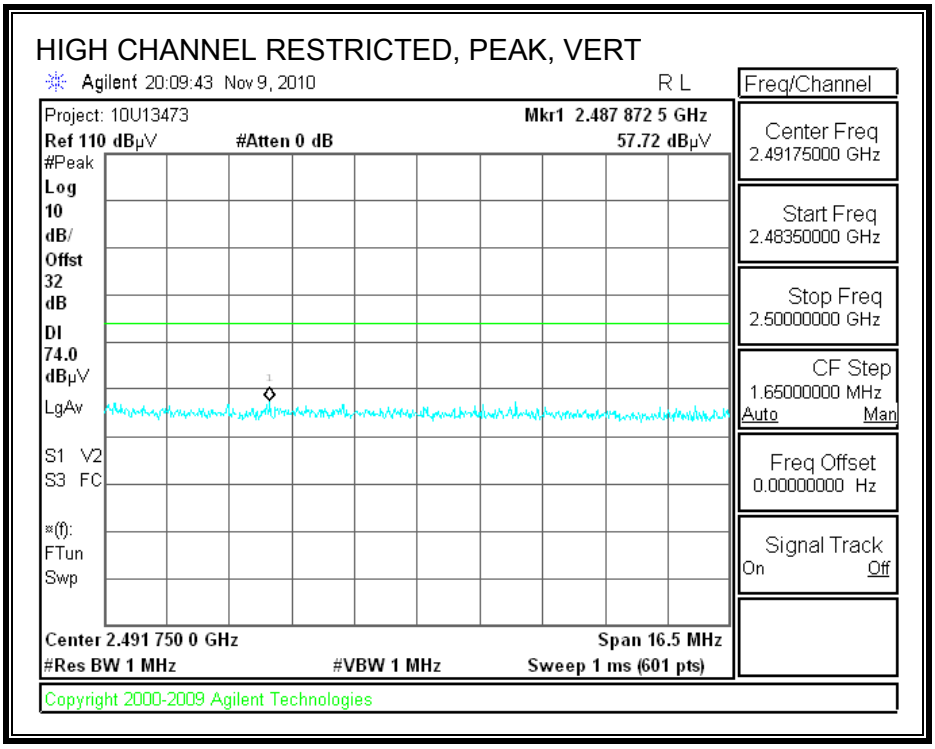


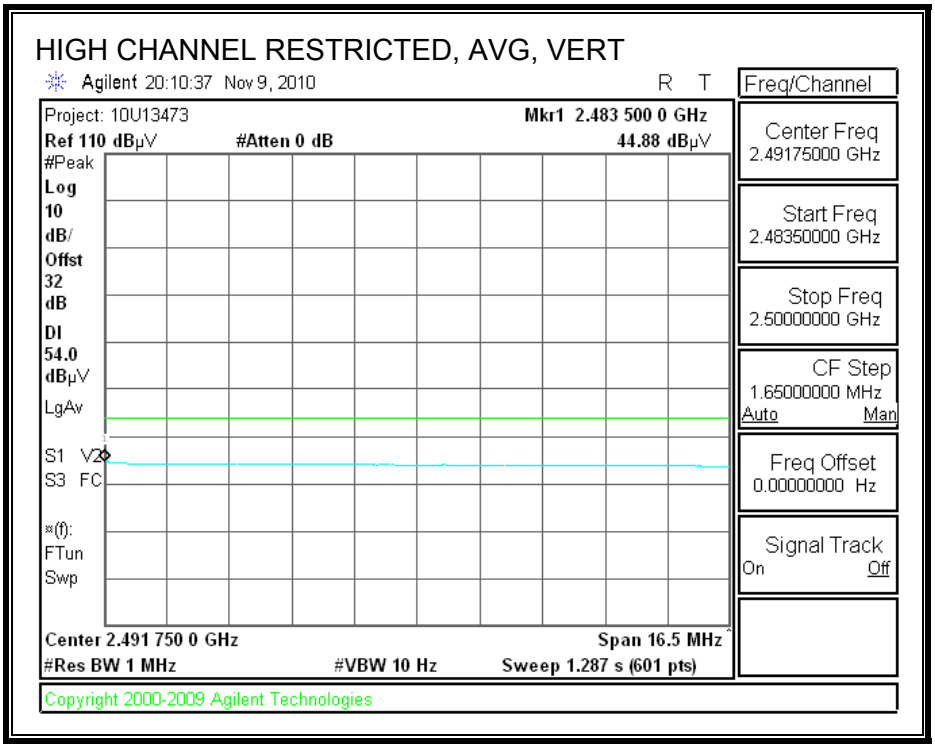
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom Chen
Date: 11/09/10
Project #: 10U13481
Company: Apple
Test Target: FCC Class B
Mode Oper: TX mode, 8PSK

f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

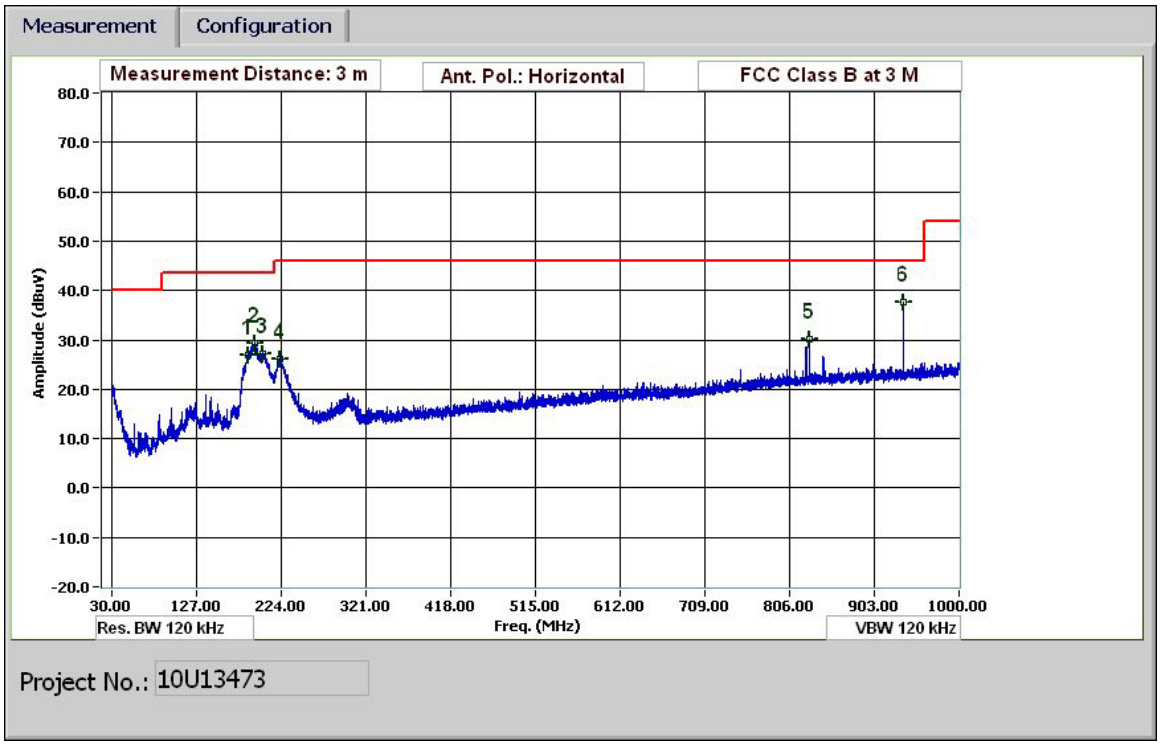
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
2402 MHz Low CH													
4.804	3.0	39.9	32.8	5.8	-34.8	0.0	0.0	43.6	74.0	-30.4	H	P	8PSK
4.804	3.0	27.9	32.8	5.8	-34.8	0.0	0.0	31.6	54.0	-22.4	H	A	8PSK
7.206	3.0	37.0	35.0	7.2	-34.7	0.0	0.0	44.6	74.0	-29.4	H	P	8PSK
7.206	3.0	24.9	35.0	7.2	-34.7	0.0	0.0	32.5	54.0	-21.5	H	A	8PSK
2402 MHz Low CH													
4.804	3.0	40.5	32.8	5.8	-34.8	0.0	0.0	44.2	74.0	-29.8	V	P	8PSK
4.804	3.0	30.3	32.8	5.8	-34.8	0.0	0.0	34.0	54.0	-20.0	V	A	8PSK
7.206	3.0	37.5	35.0	7.2	-34.7	0.0	0.0	45.1	74.0	-28.9	V	P	8PSK
7.206	3.0	24.9	35.0	7.2	-34.7	0.0	0.0	32.5	54.0	-21.5	V	A	8PSK
2441 MHz Mid CH													
4.882	3.0	39.1	32.8	5.8	-34.9	0.0	0.0	42.9	74.0	-31.1	V	P	8PSK
4.882	3.0	28.4	32.8	5.8	-34.9	0.0	0.0	32.2	54.0	-21.8	V	A	8PSK
7.323	3.0	37.2	35.2	7.3	-34.7	0.0	0.0	45.0	74.0	-29.0	V	P	8PSK
7.323	3.0	25.0	35.2	7.3	-34.7	0.0	0.0	32.8	54.0	-21.2	V	A	8PSK
2441 MHz Mid CH													
4.882	3.0	39.4	32.8	5.8	-34.9	0.0	0.0	43.2	74.0	-30.8	H	P	8PSK
4.882	3.0	27.3	32.8	5.8	-34.9	0.0	0.0	31.1	54.0	-22.9	H	A	8PSK
7.323	3.0	37.2	35.2	7.3	-34.7	0.0	0.0	45.1	74.0	-28.9	H	P	8PSK
7.323	3.0	24.9	35.2	7.3	-34.7	0.0	0.0	32.8	54.0	-21.2	H	A	8PSK
2480 MHz High CH													
4.960	3.0	38.5	32.9	5.9	-34.9	0.0	0.0	42.4	74.0	-31.6	H	P	8PSK
4.960	3.0	25.7	32.9	5.9	-34.9	0.0	0.0	29.6	54.0	-24.4	H	A	8PSK
7.440	3.0	38.9	35.4	7.3	-34.6	0.0	0.0	46.9	74.0	-27.1	H	P	8PSK
7.440	3.0	24.5	35.4	7.3	-34.6	0.0	0.0	32.6	54.0	-21.4	H	A	8PSK
2480 MHz High CH													
4.960	3.0	38.0	32.9	5.9	-34.9	0.0	0.0	41.9	74.0	-32.1	V	P	8PSK
4.960	3.0	26.7	32.9	5.9	-34.9	0.0	0.0	30.7	54.0	-23.3	V	A	8PSK
7.440	3.0	36.9	35.4	7.3	-34.6	0.0	0.0	45.0	74.0	-29.0	V	P	8PSK
7.440	3.0	24.5	35.4	7.3	-34.6	0.0	0.0	32.6	54.0	-21.4	V	A	8PSK

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

8.3. WORST-CASE BELOW 1 GHz

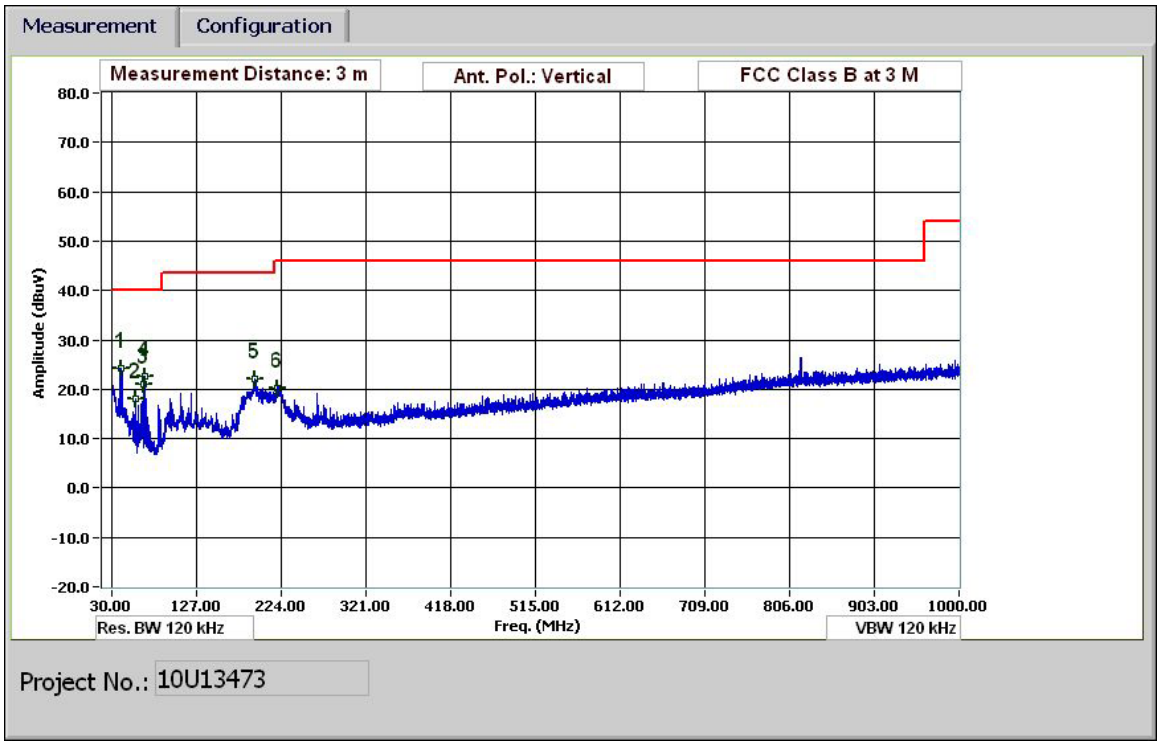
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom Chen
Date: 11/15/10
Project #: 10U13473
Test Target: FCC class B
Mode Oper: TX mode BT, worst case (SEMCO)

f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Horizontal													
186.126	3.0	43.6	11.1	1.2	29.0	0.0	0.0	26.9	43.5	-16.6	H	P	
193.687	3.0	45.7	11.5	1.2	29.0	0.0	0.0	29.4	43.5	-14.1	H	P	
202.807	3.0	42.9	12.0	1.3	28.9	0.0	0.0	27.3	43.5	-16.2	H	P	
222.488	3.0	41.8	11.9	1.4	28.9	0.0	0.0	26.2	46.0	-19.8	H	P	
829.233	3.0	35.0	21.2	2.9	29.0	0.0	0.0	30.1	46.0	-15.9	H	P	
936.037	3.0	41.1	21.9	3.1	28.5	0.0	0.0	37.6	46.0	-8.4	H	P	
Vertical													
39.96	3.0	39.2	14.1	0.6	29.6	0.0	0.0	24.2	40.0	-15.8	V	P	
57.241	3.0	39.1	7.9	0.7	29.6	0.0	0.0	18.0	40.0	-22.0	V	P	
66.121	3.0	41.9	8.1	0.7	29.6	0.0	0.0	21.1	40.0	-18.9	V	P	
68.042	3.0	43.2	8.2	0.7	29.6	0.0	0.0	22.5	40.0	-17.5	V	P	
194.287	3.0	38.2	11.5	1.2	29.0	0.0	0.0	22.0	43.5	-21.5	V	P	
220.208	3.0	35.9	11.9	1.3	28.9	0.0	0.0	20.3	46.0	-25.7	V	P	

Rev. 1.27.09
Note: No other emissions were detected above the system noise floor.

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

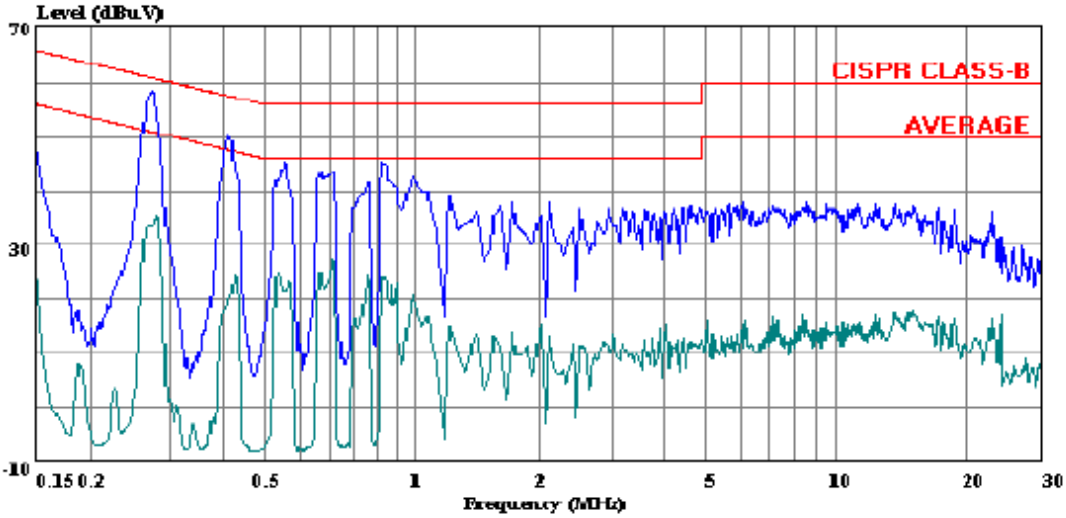
CONDUCTED EMISSIONS DATA (115VAC 60Hz)

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.28	58.46	--	33.69	0.00	60.94	50.94	-2.48	-17.25	L1
0.41	50.34	--	19.93	0.00	57.65	47.65	-7.31	-27.72	L1
0.93	45.32	--	24.30	0.00	56.00	46.00	-10.68	-21.70	L1
0.27	51.80	--	26.06	0.00	61.06	51.06	-9.26	-25.00	L2
0.41	45.95	--	13.11	0.00	57.73	47.73	-11.78	-34.62	L2
0.55	40.87	--	17.33	0.00	56.00	46.00	-15.13	-28.67	L2
6 Worst Data									

LINE 1 RESULTS

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 7 File#: 10U13473-LC.EMI Date: 11-17-2010 Time: 14:21:18



Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: Tom Chen
Project # : 10U13473
Company : ACI
Configuration: EUT with Charger and headset
Mode : TX worst case and Charging
Target : FCC Class B
Voltage : 115 VAC / 60 Hz
: L1: (Peak: Blue, Average: Green)

LINE 2 RESULTS